PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	) Group Art Unit: 2143
SRINIVASAN, Thiru	) Examiner: ENGLAND, David E.
Serial No.: 09/517,613	)
Filed: March 2, 2000	)
Atty. File No.: 1642 (42059-01010)	)
For: "SYSTEM AND METHOD FOR AUTOMATED DOWNLOAD OF MULTIMEDIA FILES"	)

APPELLANTS' BRIEF ON APPEAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
MAIL STOP: APPEAL BRIEF - PATENTS

Dear Sir:

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G. A copy of U.S. Patent No. 5,953,005 to Liu.

I. REAL PARTY IN INTEREST

The inventor of the above-noted patent application has assigned all respective rights in relation to the above-noted patent application, including any resulting patent, to U.S. West, Inc., a Delaware corporation formerly with a place of business in Denver, Colorado, in the Assignment that was recorded at the U.S. Patent Office on March 2, 2000 at Reel 010665, Frame 0172. The

above-noted patent application, including any resulting patent, was then assigned by U.S. West, Inc. to Qwest Communications International Inc., a Delaware corporation with a place of business in Denver, Colorado, in the Assignment that was recorded at the U.S. Patent Office on September 25, 2000 at Reel 010814, Frame 0339. Therefore, Qwest Communications International Inc. is the real party in interest in this appeal.

II. RELATED APPEALS AND INTERFERENCES

Appellant, Appellant's legal representative, the assignee of the above-noted patent application, and the named inventors for the above-noted patent application are all unaware of any appeal(s) or interference(s) which will directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

The status of the claims is as follows:

1. Claims pending: 1 – 7, 9 - 14 and 16 – 20;
2. Claims rejected: 1 – 7, 9 - 14 and 16 – 20.

IV. STATUS OF AMENDMENTS (37 CFR § 1.192(c)(4))

The Applicant filed U.S. Patent Application No. 09/517,613 on Mar. 2, 2000. The application contained 19 total claims, 2 of which (Claims 1 and 10) were independent claims. The Applicant received a first Non Final Office Action, mailed November 21, 2002, wherein Claims 1 - 7 and 9 were rejected under 35 U.S.C. § 102(e) being as anticipated by U.S. Patent No. 6,389,467 (issued May 14, 2002; hereafter "Eyal"). Claims 8, 10, 12, and 14 – 19 were also rejected under 35 U.S.C. § 103(a) as being unpatentable over Eyal in view of U.S. Patent No. 5,987,103 (issued Nov. 16, 1999; hereafter "Martino"), and Claim 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Eyal in view of Martino and further in view of U.S. Patent No. 6,470,356 (issued Oct. 22, 2002; hereafter "Suzuki"). Claim 11 was not explicitly rejected but was addressed in the rejections of Claims 8, 10, 12, and 14 – 19. The Applicant filed an Amendment and Response on Feb. 20, 2003, amending Claims 6, 12, 15, and 19 to address informalities and to argue the distinctions in the claims as compared to Eyal as well as combinations of Eyal with Martino and Suzuki.

The Applicant received a Final Office Action on June 2, 2003 maintaining the above rejections. The Applicant subsequently filed a response on Nov. 3, 2003 again arguing the distinctions in the claims as compared to Eyal as well as combinations of Eyal with Martino and Suzuki, particularly with respect to lack of teachings of Eyal's provisional patent application from which the rejections are based. The Examiner, thereafter, mailed an Advisory Action to the Applicant stating that the Applicant must submit Eyal's provisional patent application to the Examiner and proof that Eyal "does not teach or suggest the specifications that are similar to the

Applicant's invention" in spite of the Examiner's duty to do so. 37 C.F.R. § 1.104(a)(1). After the Applicant submitted Eyal's provisional patent application, the Examiner issued a second Advisory Action stating that the provisional patent application does teach portions of the Applicant's claims. Subsequently, the Applicant submitted a first Request for Continued Examination ("first RCE") with a Declaration under 37 C.F.R. § 1.131 swearing behind the Eyal reference.

In the ensuing Non Final Office Action, mailed June 18, 2004, the Examiner rejected unamended Claims 1 and 16 for the first time under 35 U.S.C. § 112, first paragraph, Claim 16 for the first time under 35 U.S.C. § 112, second paragraph, Claims 1 – 11, 13 – 15, 17 and 18 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,587,127 (issued July 1, 2003; hereafter "Leeke"), and Claims 12 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Leeke in view of Martino without once addressing the Applicant's Declaration. The Examiner also objected to the drawings under 37 C.F.R. § 1.83(a) for failing to show every feature of the invention specified in the claims. The Examiner then summarily stated that the "Applicant's arguments with respect to Claims 1- 19 have been considered but are moot in view of the new grounds of rejection". In response, the Applicant amended Claims 1, 10, and 16 and canceled Claim 15 to address the Examiner's rejections and objection, on September 20, 2004. The Applicant then received a Final Office Action, mailed Feb. 25, 2005, in which the Examiner rejected Claims 1 - 11, 13, 14, 17 and 18 under 35 U.S.C. § 102(e) as being anticipated by Leeke, Claims 12 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Leeke in view of Martino, and Claim 16 under 35 U.S.C. § 103(a) as being unpatentable over Leeke in view of U.S. Patent No. 6,601,237 (issued July 29, 2003; hereafter "Ten Kate"), stating again that the Applicant's arguments are moot based on the new grounds for rejection this time, however, using essentially the same references. In response, the Applicant filed a second Request for Continued Examination ("second RCE"), amended Claims

1, 2, 4 - 10, added Claims 20 and 21, and argued the distinctions in the claims as compared to Leeke on June 27, 2005.

The Applicant's received a Non Final Office Action, mailed on Sept. 19, 2005, wherein the Examiner again objected to the drawings under 37 C.F.R. § 1.83(a), objected to Claim 8, rejected Claim 21 under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement. The Examiner also rejected Claims 1 – 9 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,248,946 (issued June 19, 2001; hereafter "Dwek") although referenced as U.S. Patent No. 5,953,005 (issued Sept. 14, 1999). The Examiner also rejected Claims 10, 11, 13, 14, 17, 18, 20 and 21 under 35 U.S.C. § 103(a) as being unpatentable over Dwek in view of Leeke. In the Non Final office action, mailed on September 19, 2005, the Examiner also issued a "Second Office Action" wherein Claims 1 - 5, 8, and 9 were rejected under 35 U.S.C. § 102(e) as being anticipated by "Liu", a reference not cited in "Notice of References Cited" form PTO-892 as required. In this Second Office Action, the Examiner also rejected Claims 6, 7, and 10, 11, 13, 14, 17, 18, 20 and 21 under 35 U.S.C. § 103(a) as being unpatentable over "Liu" in view of Leeke. In the Applicant's response thereto, filed on Dec. 19, 2005, the Applicant amended Claims 1, 2, 10, 20, and 21, argued the distinctions in the claims as compared to U.S. Patent No. 5,953,005 which is issued to a "Liu", and argued substantively that the Nov. 3, 2003 Affidavit under 37 C.F.R. § 1.131 swearing behind the Eyal reference was also effective at swearing behind the Dwek reference.

The Examiner then issued a Final Office Action, mailed on March 13, 2006, stating, for the first time and four Office Actions later, that the Applicant's Nov. 3, 2003 Affidavit under 37 C.F.R. § 1.131 was ineffective at swearing behind either Eyal or Dwek. The Examiner also objected to the drawings under 37 C.F.R. § 1.83(a) for failing to show every feature of the invention specified in the claims. The Examiner also objected to Claim 8 under 37 C.F.R. § 1.75(c) as being improper

dependent form for failing to further limit the subject matter of a previous claim. The Examiner then rejected Claim 2 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claims 1 - 9 were also rejected under 35 U.S.C. § 102(e) as being anticipated by Dwek, wherein the Examiner incorrectly stated the Applicant's diligence requirement for an affidavit under 37 C.F.R. § 1.131. The Examiner also rejected Claims 10, 11, 13, 14, 17, 18, 20, and 21 under 35 U.S.C. § 103(a) as being unpatentable over Dwek in view of Leeke and in further view of Eyal. The Examiner rejected Claims 12 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Dwek, Leeke, and Eyal as applied to Claims 10 and 11 and in further view of Martino. The Examiner also rejected Claim 16 under 35 U.S.C. § 103(a) as being unpatentable over Dwek, Leeke, and Eyal as applied to Claims 10 and 13 and in further view of Ten Kate.

In the March 13, 2006 Final office action, the Examiner again issued an unusual "Second Office Action" in which the Examiner rejected Claims 1 - 5, 8, and 9 under 35 U.S.C. § 102(e) as being anticipated by Liu, the uncited reference. In the Second Office Action, the Examiner also rejected Claims 6 and 7 under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Leeke. Claims 10, 11, 13, 14, 17, 18, 20, and 21 were also rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Leeke and in further view of Eyal. The Examiner also rejected Claims 12 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Liu, Leeke and Eyal as applied to Claims 10 and 11 and in further view of Martino. Additionally, the Examiner rejected Claim 16 under 35 U.S.C. § 103(a) as being unpatentable over Liu, Leeke, and Eyal as applied to Claims 10 and 13 and in further view of Ten Kate. In the Applicant's response, filed June 12, 2006, the Applicant cancelled Claim 8 and withdrew Claim 21 to render the Examiner's objections moot. The Applicant traversed all of the Examiner's remaining rejections. The Examiner mailed an Advisory Action on July 27, 2006 stating that the application was still not in condition for allowance while repeating the same incorrect logic and arguing a reference that has not been

properly cited. A Notice of Appeal was filed by Applicants on Aug. 11, 1006 and this Appeal Brief is the result thereof.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim Group A: Claims 1 - 7, 9 - 14, 16 - 19 and 20.

Generally, the present invention (Claim Group A) relates to computer software that retrieves multimedia files, such as digital music files and digital video files, from the internet. The software includes various modules that allow a user to select multimedia files, search the internet for the multimedia file selections, and download those files to the user's computer. (FIG. 1 and page 6, line 16 – page 6, line 8. This software also has a scheduling feature that allows the user to schedule the time in which a particular multimedia file selection is to be downloaded. (FIG. 6 and page 12, lines 17 – 22). For example, the multimedia file selection may be a live streaming video broadcast, such as television event or live concert, scheduled at a time which the user will not have access to a computer. The selection interface module may download the scheduling information associated with the selected multimedia file such that the file may be automatically downloaded while the user is away. Additionally, the software enables multimedia selections based on multimedia category, such as a music genre (page 9, lines 16 - 22) and can be configured as a plug-in to a web browser (page 7, line 16 – page 8, line 2).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1 – 7 and 9 have been rejected as unpatentable under 35 U.S.C. § 102(e) over Dwek (i.e., U.S. Patent No. 6,248,946).

2. Claims 10, 11, 13, 14, 17, 18, and 20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dwek in view of Leeke (i.e., U.S. Patent No. 6,587,127) and in further view of Eyal (i.e., U.S. Patent No. 6,389,467).

3. Claims 12 and 19 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dwek, Leeke, and Eyal and in further view of Martino (i.e., U.S. Patent No. 5,987,103).

4. Claim 16 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dwek, Leeke, Eyal, and in further view of Ten Kate (i.e., U.S. Patent No. 6,601,237).

5. Claims 1 – 5, and 9 have been rejected as unpatentable under 35 U.S.C. § 102(e) over "Liu", an uncited reference.

6. Claims 6 and 7 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over "Liu" in view of Leeke.

7. Claims 10, 11, 13, 14, 17, 18, and 20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over "Liu" in view of Leeke and in further view of Eyal.

8. Claims 12 and 19 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over "Liu", Leeke, and Eyal and in further view of Martino.

9. Claim 16 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over "Liu", Leeke, Eyal, and in further view of Ten Kate.

VII. ARGUMENTS

Claim Group A

The Examiner rejected Claims 1- 7, and 9 as being anticipated by Dwek with Claims 1 – 4 and 9 being anticipated by the uncited Liu as well. The Examiner rejected Claims 10 – 14, 16 - 19, and 20 as being obvious over various combinations of Dwek with Leeke, Eyal, Martino, and/or Ten Kate. Additionally, the Examiner rejected Claims 10 – 14, 16 - 19, and 20 as being obvious over various combinations of "Liu" with Leeke, Eyal, Martino, and/or Ten Kate.

Regarding Dwek and Eyal, each of the rejected claims is believed to be patentable over these references because the Applicant, on Nov. 3, 2003, submitted a 37 CFR § 1.131 Declaration (the "Declaration") swearing behind Eyal. Eyal has an effective filing date of Jan. 24, 2000 based on a U.S. Provisional Patent Application No. 60/177,786. The Applicant's Declaration included, as evidence, an internal invention disclosure form dated Mar. 11, 1999 coupled with diligence, thereby effectively swearing behind Eyal. The Applicant's declaration is also effective at swearing behind the later cited Dwek because Dwek has an effective filing date of only Mar. 1, 2000 - one day prior to the Applicant's filing date.

Diligence is only required from a date prior to the effective date of a reference to the filing of the Applicant's patent application. 37 C.F.R. § 1.131(b). In this case, the Declaration showed the patent attorney's diligence in preparing a patent application from a date prior to the effective date of Eyal (Jan. 24, 2000) to the filing date of the present application (i.e., Mar. 2, 2000), a period of roughly 5 weeks. In response, the Examiner (Mr. David England) stated that the "Applicant's arguments with respect to Claims 1 - 19 have been considered but are moot in view the new ground(s) of rejection". Since no amendments were made to the claims when the Declaration was filed, the Examiner's next Office Action clearly lead the Applicant to believe that the declaration

was effective in removing Eyal as a reference. Later, when Dwek was cited, the Applicant's argued that the Declaration was already effective at swearing behind Dwek. The same Examiner then, for the first time, stated that the declaration was ineffective and reinstated Eyal as prior art. This begs the question, if the declaration was ineffective, why were there new grounds for rejection. Clearly, there should not have been because of the Examiner's duty to make a thorough examination and the Examiner should have again finally rejected the claims. 37 CFR §1.104; *see also*, MPEP § 700. In other words, the Examiner would not need additional art to reject the claims if the declaration was ineffective and he should have stated so in the following office action – not three office actions later.

Regardless, the Examiner stated that diligence had not been shown because he incorrectly interprets the requirement for diligence as being established from the date of the Applicant's invention disclosure form (i.e., Mar. 11, 1999) to the date of filing. As stated above, diligence is only required from a date before the effective date of a reference to the filing of the Applicant's patent application. 37 C.F.R. § 1.131(b) (The showing of facts shall be such...to establish...conception of the invention prior to the effective date of the reference coupled with due diligence from prior to said date...to the filing of the application).

In the declaration, the Applicant's patent attorney, Mr. Kenneth J. Johnson, swore that he prepared a patent application on December 28, 1999, a date that is prior to both Dwek and Eyal and clearly visible in the evidenced correspondence to the inventor. From that time to the date of filing, Mr. Johnson stated that he received feedback from the inventors about the patent application in January or early February 2000 (item 6 of the declaration), made corrections thereto on February 9, 2000 (item 7 of the declaration), prepared formal documents on February 21, 2000 (item 8 of the declaration), received the formal documents from the inventors on February 28, 2000 (item 9 of the declaration) and filed the application on March 2, 2000. Each of these facts clearly illustrate

diligence and were supported with evidence also submitted with the Declaration. The Examiner stated that there is "almost a year from the last known correspondence to the filing of the Applicant's Application." This is simply not true. The last known correspondence from Mr. Johnson to the inventor prior to the filing of the patent application was, in fact, only 10 days. The Applicant maintains that the declaration coupled with the associated evidence fully establishes diligence from December 28, 1999 (i.e., prior to the two referenced filing dates) through the filing of the present application on March 2, 2000 (i.e., period of just over 2 months).

The Examiner also stated that the "Applicant has not in anyway proved that the teachings in the information filed in the declaration under 37 C.F.R. § 1.131 teaches what is stated in their claim language as stated now nor is there any comparison to what was taught by the Applicant in said documents, just mere allegations". The Applicant has shown the Examiner specific teachings in the invention disclosure form where the claims are supported. For example, the Applicant recites "software running at the centralized web site" (i.e., the claimed processing module) on page 3 of the invention disclosure form that "will organize the data received from the web sites by category". The Applicant also discloses "a program guide" (i.e., the claimed selection interface) on page 3 of the invention disclosure form to select a broadcast program and a "player" (i.e., the claimed file download service) on pages 4 and 5 that receives a broadcast program for viewing on a computer. Scheduling of these programs as claimed is described on page 3 of the invention disclosure form.

Although these elements may have names that differ from the elements recited in the claims, there is no requirement that every word in a claim be identical to that disclosed in an information disclosure form. The only requirement must be that one skilled in the art would know how to make and use the invention without undue experimentation upon reading information disclosure form. The Applicant respectfully submits that one skilled in the art of software engineering would be enabled by the subject matter contained in the Applicant's invention disclosure form to make and

use the invention without undue experimentation upon reading the information disclosure form. Because the Applicant's invention disclosure form exhibited in the Declaration properly supports the claims and because this invention disclosure form predates both Dwek and Eyal and diligence during the appropriate period has been established, the Applicant believes that the Declaration effectively swears behind each of the cited references. Since the Declaration effectively swears behind the Dwek and Eyal references, Claims 1, 10, and 20 are patentable over these references. Since independent Claims 1, 10, and 20 are patentable over either Dwek or Eyal, the dependent claims (i.e., Claims 2 - 7, 11 – 14, and 16 - 19) are patentable as well.

Regarding Liu (i.e., the "Second Office Action"), the Applicant addresses the rejections associated with Claims 1 – 5 and 9 since the remaining rejections rely on Eyal, which the Applicant maintains is not prior art based on the submitted Declaration. The Examiner did not explicitly reject Claims 1 - 4 and 9 under 35 U.S.C. § 102(e). Rather, the Examiner only provided a quote of 35 U.S.C. § 102(e) and stated afterwards that Liu teaches various elements Applicant's claims. Additionally, the Examiner failed to properly cite Liu as a reference by including, for example, the number and date, and name of the patentee. *See e.g.*, 37 CFR § 1.104 and M.P.E.P. § 707.05. A simple search of the Patent Office patent database revealed that there are 9,407 patents having inventors with the name of Liu. Since the Applicant cannot be expected to search all of these patents to understand the applicability of "Liu" to rejected claims, the Applicant demanded a new Office Action to address the applicability of Liu. The Examiner never provided the requested information.

However, in a previous Non Final Office Action mailed on Sept. 19, 2005, the Examiner used Dwek to reject Claims 1 – 9 under 35 U.S.C. 102(e), while incorrectly referring to Dwek as U.S. Patent No. 5,953,005 (issued Sept. 14, 1999 to "Liu"). Even though U.S. Patent No. 5,953,005 has never been properly cited in a PTO form 892, the Applicant attempted to address this reference

and show clear distinctions between the Applicant's claims and the reference. When the Examiner later on relied upon "Liu" in a Final Office Action mailed Mar. 13, 2006, the Applicant could only assume that "Liu" meant U.S. Patent No. 5,953,005. Even assuming that U.S. Patent No. 5,953,005 is "Liu", the Applicant's claims clearly distinguish over this reference. For example, U.S. Patent No. 5,953,005 teaches an online karaoke system from which a user may select songs, but nowhere does U.S. Patent No. 5,953,005 teach any type of scheduling for the availability of a multimedia file. In fact, U.S. Patent No. 5,953,005 does not once use any form of the word schedule. Nor does U.S. Patent No. 5,953,005 teach searching a data network for a multimedia file, let alone returning information pertaining to location of a multimedia file. U.S. Patent No. 5,953,005 simply does not teach that which the Applicant claims. Accordingly, Claims 1, 10, and 20 are patentable over U.S. Patent No. 5,953,005.

Since independent Claims 1, 10, and 20 are patentable over U.S. Patent No. 5,953,005, the dependent claims (i.e., Claims 2 - 7, 11 – 14, and 16 - 19) are patentable as well. However, the distinctions of the Applicant's claims over U.S. Patent No. 5,953,005 do not stop at the independent claims. In Claim 5, the Applicant recites that the software of the Group A Claims may be implemented as a "plug-in" to a web browser. The Examiner states that U.S. Patent No. 5,953,005 teaches such, but U.S. Patent No. 5,953,005 only teaches "applets" at the location referenced in the Examiner's rejection. Those skilled in the art understand that a "plug-in" is a computer program that interacts with a main application, such as a web browser or an email program to provide the main application with a certain, usually very specific, function. An applet, on the other hand, is software that runs in another software program but does not provide the other software program with any additional features. Since, U.S. Patent No. 5,953,005 does not teach the Appicant's claimed plug-in, Claim 5 is patentable over this reference.

VIII. CLAIMS APPENDIX

1. A system for automatically retrieving and playing multimedia files, comprising:

a network access interface through which access to a data network may be attained;

a processing module configured to search the data network for a first multimedia file and to return information including an identifier of said first multimedia file, a first location of said first multimedia file and a first datum relating to a first schedule of the availability of said first multimedia file, wherein said processing module is further configured to categorize said first multimedia file and create first categorization information relating to said first multimedia file;

wherein said processing module is configured to search the data network for a second multimedia file and to return information including a second identifier of said second multimedia file, a second location of said second multimedia file and a second datum relating to a second schedule of the availability of said second multimedia file, wherein said processing module is further configured to categorize said second multimedia file and create second categorization information relating to said second multimedia file;

wherein said processing module, said first location, and said second location are situated within distinct domains within the data network;

a selection interface in communication with said processing module which provides for presentation of the returned information, and is configured to receive and process a selection for accessing a selected multimedia file from the data network and compile a download schedule; and

a file download device in communication with the selection interface which, based on the download schedule, automatically accesses said first multimedia file at said location through said network access interface and downloads the selected multimedia file.

2. The system of claim 1 further including a centralized location on the data network employable to search the data network for the second multimedia file, receive information including

the second identifier of said second multimedia file, the second location of said second multimedia file, the second datum relating to the second schedule of availability of said second multimedia file and the second categorization information relating to said second multimedia file, and provide said second categorization information to the processing module.

3. The system of claim 1 wherein the data network is the Internet.

4. The system of claim 1 wherein the interface, processing module, selection interface, and download device are configured on a personal computer.

5. The system of claim 1 wherein at least one of: the processing module, the selection interface, and the file download device are configured as plugins in a web browser installed in the personal computer.

6. The system of claim 1 wherein the selection interface includes at least one of:

a first selection for real time play of said first multimedia file which is downloaded; and

a second selection for storing in a memory said first multimedia file which is downloaded in memory.

7. The system of claim 1 wherein an interface is provided for restricting categories of multimedia files to be presented by the selection interface.

9. The system of claim 6 wherein the system includes a media player for playing said first multimedia file in real time.

10. A method of retrieving multimedia files over a data network from a remote site in connection with the data network, comprising the steps of:

providing a central processor for searching a plurality of multimedia websites for a plurality of multimedia files and a schedule of the availability of said plurality of multimedia files categorizing said plurality of multimedia files, and creating a listing containing information relating to said plurality of multimedia files;

wherein said plurality of multimedia websites searched comprise at least two websites in distinct domains of the data network;

presenting an interactive interface which includes the listing and through which individual selections may be made for downloading the multimedia files from at least one of the plurality of multimedia websites;

receiving an input through the interactive interface selecting a particular number of the plurality of multimedia files from the listing;

compiling a download schedule based on the received input, wherein the schedule includes a description of the multimedia file selected, day and time for the download, and download information, including the domain; and

based on the input received through the interface, accessing and downloading over the data network, the selected multimedia files from the selected multimedia websites.

11. The method of claim 10 further comprising at least one of the following additional steps:

storing the multimedia files in memory; and

playing the selected multimedia files.

12. The method of claim 11 wherein only a predetermined number of multimedia files may be stored in memory.

13. The method of claim 10 wherein the multimedia files are retrieved according to a time schedule.

14. The method of claim 10 wherein the data network is the Internet.

16. The method of claim 13 wherein any scheduling conflicts between the downloading of multimedia files are detected and the downloading is rescheduled as necessary to resolve conflicts.

17. The method of claim 10 wherein the listing is created based on topical categories.

18. The method of claim 17 wherein the topical categories are amended based on the received inputs.

19. The method of claim 10 wherein the listing is created and transmitted automatically on a periodic basis.

20. A system for automatically retrieving and playing multimedia files, comprising:

a network access interface through which access to a data network may be attained;

a scheduler configured to search a plurality of distinct websites for a multimedia file, obtain a schedule of availability of said multimedia file, categorize said multimedia file and create a first list containing information about said multimedia file;

a selection interface in communication with said scheduler which provides for presentation of said first list to a user, and is configured to receive and process user inputs for accessing multimedia files from said website and compile a user download schedule; and

a file download device in communication with said selection interface, which, based on said user download schedule, automatically accesses said selected multimedia file through said network access interface.

IX. EVIDENCE APPENDIX

The Applicant's Declaration submitted Nov. 3, 2003 and associated evidence establishing diligence.

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:	Group Art Unit: 2143
SRINIVASAN	Examiner: DAVID E. ENGLAND
Serial No.: 09/517,613	
Filed: MARCH 2, 2000	
Confirmation No.: 4139	
Atty. File No.: 42059-01010	
For: "SYSTEM AND METHOD FOR AUTOMATED DOWNLOAD OF MULTIMEDIA FILES"	

CERTIFICATE OF MAILING

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450 ON NOVEMBER 3, 2003

MARSH FISCHMANN & BREYFOGLE, LLP

BY: _____
TERRI BELICH

DECLARATION UNDER 37 CFR 1.131

MAIL STOP: RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313

Dear Sir:

1. I, Kenneth J. Johnson, PTO Registration No. 36,834, am the Patent Attorney who received instructions from our client's predecessor, U.S. West Communications, Inc., to prepare and file a U.S. Patent Application entitled, "SYSTEM AND METHOD FOR AUTOMATED DOWNLOAD OF MULTIMEDIA FILES" and invented by Thiru Srinivasan.

2. This matter was designated by U.S. West Communications, Inc. as Docket No. 1642 and by my previous law firm, Holme Roberts & Owen LLP as Matter No. 42059-01010.

3. This matter has been transferred to and is being handled my new law firm, Marsh Fischmann & Breyfogle LLP, under the same Matter No. 42059-01010.

4. In 1999, while at Holme Roberts & Owen LLP, I received an invention disclosure from the U.S. West Communications' Law Department for this invention, which was entitled at that time, "WEB AUDIO/VIDEO GUIDE." See Attachment at Tab 1.

5. I prepared a patent application based on this invention and on December 28, 1999, prior to the January 24, 2000 provisional filing relating to the Eyal patent (USPN 6,389,467), I mailed a cover letter attaching a draft of a patent application on our client's invention to the inventor, Thiru Srinivasan, based on his earlier-received invention disclosure. See Attachment at Tab 2.

6. Sometime in January or early February, 2000, I received feedback from the inventor, and based thereon, made certain corrections to the first draft of the patent application.

7. On February 9, 2000, I submitted to the Word Processing Department of Holme Roberts & Owen LLP corrections to the patent application along with a Word Processing Work Request Form, in order to have the application revised accordingly. See Attachment at Tab 3.

8. I arranged to have formal documents prepared for signature by the inventor, and on February 21, 2000, I mailed a cover letter to the inventor along with a final draft of the patent application and the formal documents for his signature. See Attachment at Tab 4.

9. Subsequently, I received the signed formal documents back from the inventor, evidencing his execution of these documents on February 28, 2000. See Attachment at Tab 5.

10. On March 2, 2000, I filed the patent application and formal documents with the U.S. Patent and Trademark Office, and the application was assigned U.S. Pat. App. No. 09/517,613.

11. The undersigned Patent Attorney acknowledges that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon. All statements made of the undersigned's own knowledge are true and all statements made on information and belief are believed to be true.

This Declaration is signed by the undersigned Patent Attorney on the date reflected below.

Respectfully submitted,

MARSH FISCHMANN & BREYFOGLE LLP

By: _____

Kenneth J. Johnson, Esq.
Registration No. 36,834
3151 South Vaughn Way, Suite 411
Aurora, Colorado 80014
(303) 338-0997

Date: November 3, 2003

RECEIVED
MAR 11 1999
US WEST LAW DEPT

Law Department Use Only
Docket No. 1642
Date Rec'd
USW Entity
Rec'd by (init.)

INVENTION DISCLOSURE

DIRECTIONS

Complete EVERY ITEM. If any item is not applicable or unknown, please indicate.

All inventors should sign the form (Item 14), as well as two witnesses (Item 15) and your supervisor (Item 16).

Send the completed, ORIGINAL form to the U S WEST Law Department - Intellectual Property Group, 7800 East Orchard Road, Suite 490, Englewood, CO 80111. You may FAX the form (FAX No. 303-793-6563), but please also send the original. If you have any questions, contact the Law Department at 303-793-6276 or 303-796-6030.

This document is available in electronic form on the file server at U S WEST Advanced Technologies, Inc. or in hard copy form from the Law Department. A sample completed form is also available from the Law Department.

Since patent rights can be lost by public disclosure, please keep your invention confidential until advised otherwise by the Law Department.

* *

(1) **Invention Title.** Give a short (10 words of less) descriptive title of the invention.

Web Audio/Video Guide.

(2) **Invention Summary.** State what you regard as the key invention concept (30 words of less).

A method and system that allows Internet users to receive the Web Audio/Video Guide and to program the desktops to view the desired programs at the designated times.

(3) **Purpose and Problems Solved.** Briefly state why the invention was developed, what problems it solves and the advantages it has over existing products or processes.

The invention was developed for the following reasons:

- To promote E-commerce.

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- To increase traffic to web sites selling products and services
- To avoid the burden on the user to visit each web site to know what the programming schedule looks like for the week.
- To organize audio and video programming from different web sites.
- To standardize the publication of a Web Audio/Video Guide.
- To receive the Web Audio/Video Guide based on categories of interest to the user. Examples of categories of interest include concerts, auctions, distance learning, beauty contest, home shopping, congressional debate, merger and strategic alliance announcements, local news, financial news, political news, general news, sports news, movies, dramas, science fictions, music, talk shows, sports, conference call after an earnings announcement, stockholders meeting, and life-threatening surgeries.
- To help the user program the desktop and to view the program of interest at the designated date and time.

The following problems are found to exist with the available products/services:

1. Millions of households receive the paperback edition of the TV Guide every Sunday as part of the newspaper. If a user is interested in a particular program, then he/she has to make a note of the date and time the program will be broadcast, and be present to watch the program via a TV. Alternatively, he/she may program a VCR to record the program for viewing at later time. The TV Guide does not list programs broadcast by a particular channel by categories such as movie, drama, news, cartoon, sports, and wildlife, although there are specialized channels for some of the categories (for example, ESPN for sports, Cartoon Network, and HBO for movies).

2. Electronic TV Guide (www.tvguide.com) is available on a particular channel broadcast by cable TV operators where the program listing of various channels scrolls by on the TV screen. The listing pertains to programs offered by different channels for a given day. Again, the user needs to keep a watch on the listing in order to select the program of interest or program the VCR for viewing at a later time.

3. There are sophisticated Remote Controls available in the market that will help the user select a particular program by clicking on a button (for example, activating a pay-per-view program) that will take him/her right to the channel that broadcasts the program. Again, the user needs to keep a close watch on the listing that scrolls by on the TV screen.

The following advantages may be found with the system described in this invention disclosure:

- There are many web sites that deal with both audio and video broadcasts. Typically, there are no guides available that list the programs for audio broadcasts. The Web Audio/Video Guide will be a one-stop source for all types of broadcasts.
- Today, more and more events are carried either live or pre-recorded on the Internet This invention will present a comprehensive listing of all programs.
- A centralized web site where all users can go to receive a copy of the Web Audio/Video Guide.
- The user receives, on a weekly-basis and in an automated fashion, either a portion of or a complete copy of the Web Audio/Video Guide, based on his/her pre-configured selection of categories.
- As and when more categories of programs are added by the broadcasters, the users are given an option to add those new categories of interest to their configuration profiles.
- The user can view the received Web Audio/Video Guide and program the desktop to receive the broadcasts of interest in an automated fashion at the designated date and time.

(4) Description. Describe the invention and/or attach a description, drawing(s) , flow chart(s) and/or diagram(s), if available.

It is recommended that each web site (such as www.livebid.com, www.hollywood.com, www.cartoonnetwork.com, www.dell.com, www.uswest.com, www.abcnews.com, www.cnn.com, www.broadcast.com, and www.c-span.org) broadcasting an event creates a read-only Hyper-Text Markup Language (HTML) file, called the SCHEDULE file, according to the format shown in APPENDIX 1.

The SCHEDULE file may then automatically be transferred using the File Transfer Protocol (FTP) to a centralized site like www.uswest.com. On a weekly basis (say, midnight Sunday), the centralized web site will receive SCHEDULE files from each of the web sites. A piece of software running at the centralized web site will organize the data received from the web sites, by category, into another read-only HTML file, referred herein as the Web Audio/Video Guide The Web Audio/Video Guide is a consolidated representation of the program listing from the Internet and is available for download by the desktop users. As there is a growing desire to create more categories of programs from the broadcasters, it is necessary that the users be able to update their profile of interest. In order to achieve this capability, the centralized web site will, on a weekly basis, update a file called CATEGORY that contains all the categories of programs broadcast by the different web sites till date.

A browser plug-in, called PROGRAM RECEIVER, running in the background of the desktop, will request (on a weekly basis, say, Sunday morning at 6 AM), based on the user's preference for the different categories, a copy or portion of the Web Audio/Video Guide. The request will contain a list of the pre-configured categories of interest (done via a menu option called CATEGORY_INTEREST at the time of installation of the plug-in. This menu option will present a list of categories to start with and the list would periodically be updated as explained below) to the user.

The response received from the centralized web site will consist of two parts. The first part is the CATEGORY file that will be stored in the desktop and will help the user update the list of the pre-configured categories of interest whenever he/she desired. This is done via the menu option CATEGORY_INTEREST. The second part is either a portion of or a copy of the entire Web Audio/Video Guide. The second part will be stored by the desktop in a file called the PROGRAM_GUIDE, along with two selection buttons for each program. One for storing the program for viewing at a later time (Oracle Video Client allows this feature) and the other for viewing the program in real-time at the specified date and time.

The plug-in will, through a message display on the desktop, notify the user of the receipt of the PROGRAM_GUIDE when he/she opens the web browser. The notification will cease after the user selects the programs of interest for viewing until such time as a new PROGRAM_GUIDE appears in the desktop a week later.

The user then may access the PROGRAM_GUIDE (done via a menu option in the plug-in) and select the programs of interest either for storing the program in the desktop for viewing at a later time or for viewing the program in real-time at the specified date and time. If a pre-recorded program is selected for viewing, the plug-in will request a date and time to be selected by the user. The plug-in will resolve any conflicts in the selection of programs that may overlap in time. Once the user saves the PROGRAM_GUIDE, the plug-in will prepare a list of upcoming programs to be watched by the user. The plug-in will ensure that not more than one program may be saved (For example, a movie may take 3 to 5 GB of storage on the hard drive of the desktop) for viewing at a later time for the week.

When the appropriate time arrives, the plug-in will launch a request to the corresponding web site that will broadcast the program. At the same time, the player [Oracle Video Client – a full-motion, full-screen video player that works in conjunction with Oracle Video Server, Real Player from Real Networks, Inc. Presents only a viewing area of 5' by 5'), or Media Player (from

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Microsoft, Inc. Presents only a viewing area of 5' by 5')] will be launched to receive the program on the desktop. If the program is to be saved on the hard drive for viewing at a later time, then the player will be launched in the background. When the user is ready to watch it at a leisure time, he/she may select a menu option in the plug-in that will launch the player and start playing the program from the hard drive.

If the program is to be viewed in real-time, then the system also may alert the user as to the start of the program by sending either a e-mail or a page via the Internet.

(5) Business Area. Check the business area that best fits your invention.

[___] Network Services	[___] Multimedia/Video	[___] Speech Recognition
[___] Network Operations	[___] Digital Signal Processing	[___] Voice Messaging
[___] AIN	[___] Wireless	[___] ISDN
[___] Info Management	[___] Broadband	[_X_] Other:

___Internet_____

(6) **Responsible U S WEST Entity.** Provide the name of the U S WEST Division/Subsidiary having responsibility for the invention. This is usually the organization in which the inventor (or majority of inventors) is employed.

I.T./U S WEST, Inc.

(7) **U S WEST Project Name or No.**
a. Under what U S WEST project name or number was work done which resulted in the invention?

Loop Qualification database.

b. If the project was funded by organization(s) other than the responsible organization in Item 6 above, please name that organization(s).

Not applicable.

(8) Conception Date. When was the invention first conceived? Please list any records (engineering notebook, memos, etc.) which establish such conception.

February 2, 1999.

(9) Prototype or Model. Has a prototype/model been built? If so, when was it built and where is it now?

No

(10) Related Items. Are there any existing products, processes, patents or U S WEST invention disclosures similar or which may relate to the invention? If so, please list them.

- TV Guide.
- Systems such as Oracle Video Clients and VCRs allow users to store video and watch the programs at a later time.
- Set-top-boxes with the aid of a remote control allow users to select a particular program from a program listing for instant viewing.

(11) Sale or Public Use. Has this invention been sold, offered for sale or publicly used (field trial, etc.) or is such sale or use anticipated? If so, please supply actual or anticipated dates.

No.

(12) Publication or Disclosure. Has the invention been disclosed in a publication or disclosed to anyone outside U S WEST or is such disclosure or publication anticipated? If so, supply actual or anticipated dates.

No.

(13) Commercial Value. Briefly outline the potential commercial value of the invention (e.g., likelihood of use by others, licensing potential, etc.).

The invention will play a major role in E-commerce because it acts as a vehicle to attract users to different sites where the sellers can showcase their products and services. In addition, with the widespread introduction of Digital Subscriber Loop (xDSL) and cable modem technologies now under way, users will be able to receive high-speed video on their desktops. The explosive use of the Internet for audio and video broadcasts is driving users to look for a standard way of organizing the program listing in a manner that is usable. The convergence of PC and TV (i.e. interactive TV) demands the use of the Web Audio/Video Guide to simplify the programming and viewing of the content broadcast by the service providers. It is a reasonable expectation of both Microsoft, Inc. and Real Networks, Inc. to upgrade the respective "players" in the future to be able to play full-screen video broadcasts as their main competitor, Oracle, Inc., already has a player (i.e. Oracle Video Client) that can play full-screen video.

(14) INVENTOR SIGNATURES

First Inventor (print first, MI, last)	THIRU SRINIVASAN	Citizenship	INDIA
Home Address	9675 S. RED OAKES PLACE, HIGHLANDS RANCH, CO 80126		
USW Subsidiary/Div.	I.T.		
Work Address	6892 S. YOSEMITE CT., ENGLEWOOD, CO 80110		
Work Phone	303-689-1616	Fax	303-689-1622
Signature		Date	02-18-99

(15) WITNESS SIGNATURES
Read and understood:

Witness #1 (print name)	MADHURI KOLHATKAR		
Signature		Date	2/25/99

Witness #2 (print name)	MARGARITA KOTS		
Signature		Date	03/02/99

(16) SUPERVISOR SIGNATURE

Supervisor (print name)	PETE REINIG		
Signature		Date	03/03/1999

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Holme Roberts & Owen LLP

December 28, 1999

Thiru Srinivasan
9675 South Red Oakes Place
Highlands Ranch, Colorado 80126

Re: "SYSTEM AND METHOD FOR AUTOMATED DOWNLOAD OF MULTIMEDIA FILES"
Our File No.: 42059-01010
U S WEST Docket No.: 1642

Kenneth J. Johnson
(303)866-0639
johnsok@hro.com

Dear Thiru:

Enclosed is a draft of the above-identified patent application for your review. Please review the this application to assure that it properly and accurately describes the invention as originally disclosed in your Invention Disclosure Sheet. Please make your changes on the enclosed copy and when you are finished please call me at 866-0639 so we may discuss this application further.

While reviewing the application, keep in mind that the claims must particularly point out and distinctly claim the subject matter of the invention, so it is important that you review them very carefully. The claims attempt to cover the invention in its broadest aspects and also more specifically. The broadest claims should represent only the essential features of the invention. Review these claims for any element which could be eliminated without losing the essence of the invention. The remaining claims, in different degrees, are more limited, i.e., they contain additional elements. Check for limitations which are completely unrelated to the inventive concept, as well as additional limitations which should be included.

Please remember that this application is Confidential and Proprietary and must be treated accordingly. It should be secured at night and adequately protected during the day.

Attorneys at Law
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Fax (303)866-0200
www.hro.com

Denver
Salt Lake City
Boulder
Colorado Springs
London

If you have any questions please do not hesitate to contact me.

Sincerely,

Kenneth J. Johnson

Enclosure

Deliver to: _____ Floor: _____

WORD PROCESSING WORK REQUEST FORM

Submitted By: K Nickerson Ext. 639 Floor: 43

☞ Document Number: 574844 Version _____ ☜

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Author		agmt-corp-con-depo-fax-form-list-memo-mtg-other-plead-rolo-rsch
Document Type		if not specified 93210
Client #		20000 will be used
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Practice Group		
PG Sub Type		

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Tape Submission: ☐ Side A *or* ☐ Side B __¼ __½ __¾ __Full	**Printing:** ☐ Draft ☑ Final __Bond __Ltrhd ☐ 11" ☐ 14"	**Format:** ☐ ~~HRO~~ ☒ As Is **Auto Numbers:** ☐ Yes ☐ No **Tables:** ☐ Yes ☐ No **Graphics:** ☐ Powerpoint ☐ Visio	Proofreading: ☐ Correct obvious errors - *or* - ☐ Verbatim ☒ Proof revisions only ☐ Proof against original ☐ Proof all for sense, consistency and grammar ☐ Proof all as above--let author review first ☐ Bluebook cite form

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#27587

Holme Roberts & Owen LLP

February 21, 2000

Thiru Srinivasan
9675 South Red Oakes Place
Highlands Ranch, CO 80126

Re: "SYSTEM AND METHOD FOR AUTOMATED DOWNLOAD OF MULTIMEDIA FILES"
Our File No.: 42059-01010
U S WEST Docket No.: 1642

Kenneth J. Johnson
(303)866-0639
johnsok@hro.com

Dear Thiru:

Enclosed is the above-identified patent application for your review. Please review the application to assure that it properly and accurately describes the invention as originally disclosed in your Invention Disclosure Sheet. Please make your changes (if any) on the enclosed application and when you are finished, please call me at 866-0639 so we may discuss this application further.

Attorneys at Law

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80203-4541
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Denver
Salt Lake City
Boulder
Colorado Springs
London

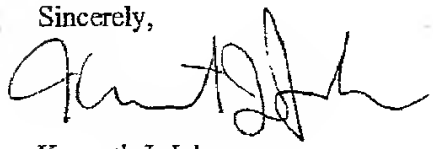
While reviewing the application, keep in mind that the claims must particularly point out and distinctly claim the subject matter of the invention, so it is important that you review them very carefully. The claims attempt to cover the invention in its broadest aspects and also more specifically. The broadest claims should represent only the essential features of the invention. Review these claims for any element which could be eliminated without losing the essence of the invention. The remaining claims, in different degrees, are more limited, i.e., they contain additional elements. Check for limitations which are completely unrelated to the inventive concept, as well as additional limitations which should be included.

I am enclosing along with this application, the Declaration and Assignment for your execution if there are no further revisions to the application. As always, please execute where indicated and have a notary sign the Assignment.

Please remember that this application is Confidential and Proprietary and must be treated accordingly. It should be secured at night and adequately protected during the day.

I have enclosed a self-addressed stamped envelope for your convenience. If you have any questions please do not hesitate to contact me.

Sincerely,



Kenneth J. Johnson

Enclosures

DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY

Atty. Docket No. 1642 (42059-01010)
First Named Inventor: Thiru Srinivasan

As the first and sole named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

"COMMUNITY OF PRACTICE SERVER"

the specification of which:

[X] is attached hereto; or
[] was filed on (mm/dd/yy)_____as U.S. Application Number or PCT International Application Number _____, and was amended on (mm/dd/yy) _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below, and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	*Country*	*Foreign Priority Date (MM/DD/YY)*	*Priority Not Claimed*	*Certified Copy Attached? (Yes/No)*

I hereby claim the benefit under Title 35, United Stated Code, § 119(e) of any United States provisional application(s) listed below

Application Number(s)	*Filing Date (MM/DD/YY)*

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

Application Number(s)	*Filing Date (MM/DD/YY)*	*Status: Patented, Pending, Abandoned*

I hereby appoint the practitioners associated with Customer Number 22193 to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to that Customer Number. Telephone calls should be directed to U S WEST, Inc , Law Department--Intellectual Property Group, at (877) 879-4747 or (303) 672-2700

22193

PATENT TRADEMARK OFFICE

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole or First Inventor Thiru Srinivasan

Inventor's signature _____ Date 2/28/00

Post Office Address Same as residence

Residence 9675 South Red Oakes Place, Highlands Ranch, Colorado 80126 Citizenship USA

Attorney Docket: 1642 (42059-01010)

ASSIGNMENT

For the sum of One Dollar ($1.00) and other good and valuable consideration, receipt of which is hereby acknowledged, I, Thiru Srinivasan, of 9675 South Red Oakes Place, Highlands Ranch, Colorado 80126, do hereby assign, sell and set over to U S WEST, Inc., a corporation organized and existing under the laws of the State of Delaware, having a place of business at 1801 California Street, Denver, Colorado 80202, hereinafter referred to as the ASSIGNEE, its successors, assigns or other legal representatives, the entire right, title and interest, domestic and foreign, in and to the inventions and discoveries in:

"SYSTEM AND METHOD FOR AUTOMATED DOWNLOAD OF MULTIMEDIA FILES"

set forth in the application for United States Letters Patent, executed by me on the 25th day of February, 2000, including the right of said ASSIGNEE, its successors, assigns or other legal representatives to make applications and to receive Letters Patent for said inventions and discoveries in any and all foreign countries in its or their own name or names, or in my name, at its or their election, and I hereby assign, sell and set over to said ASSIGNEE, its successors, assigns or other legal representatives, all rights or priority in and to said inventions and discoveries in all countries.

And I hereby agree for myself, heirs, successors, assigns or other legal representatives to execute any and all papers, including applications for Letters Patent of any and all kinds and in any and all countries, and to perform any and all acts which said ASSIGNEE, its successors, assigns or other legal representatives may deem necessary to secure thereto the rights herein assigned, sold and set over.

And I hereby represent and warrant that I have not granted any rights inconsistent with the rights granted herein.

Date: 2/28/00

By: _____
Thiru Srinivasan

STATE OF COLORADO)
) ss.
COUNTY OF Denver)

On this 25th day of February, 2000, personally appeared before me Thiru Srinivasan, to me known to be the person named in and who executed the above instrument, and acknowledged that he executed the same for the uses and purposes therein mentioned.

_____
Notary Public

(SEAL)

My Commission Expires October 8, 2003

My Commission expires: _____

#596812 v1

X. RELATED PROCEEDINGS APPENDIX

None.

XI. CONCLUSION

Based upon the foregoing, Appellant respectfully requests the Board to reverse the Examiner's §102(e) and § 103(a) rejections of all pending claims and to pass the above-identified patent application to issuance.

Respectfully submitted,

MARSH FISCHMANN & BREYFOGLE LLP

By: /GREGORY T. FETTIG/
Gregory T. Fettig
Registration No. 50,843
3151 South Vaughn Way, Suite 411
Aurora, Colorado 80014
(720) 562-5509

Date: October 11, 2006

APPENDIX A

A copy of U.S. Patent No. 6,248,946 issued to Dwek.

US006248946B1

(12) **United States Patent**
Dwek

(10) **Patent No.: US 6,248,946 B1**
(45) **Date of Patent: Jun. 19, 2001**

(54) **MULTIMEDIA CONTENT DELIVERY SYSTEM AND METHOD**

(75) Inventor: **Norman Scott Dwek**, Deal, NJ (US)

(73) Assignee: **iJockey, Inc.**, New York, NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/516,768**

(22) Filed: **Mar. 1, 2000**

(51) **Int. Cl.**[7] **G10H 1/26**

(52) **U.S. Cl.** ..... **84/609**; 84/477 R; 84/DIG. 6; 434/307 A

(58) **Field of Search** ..... 84/609–614, 634–638, 84/477 R, 478, DIG. 6; 434/307 A

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,890,910	*	4/1999	Tsurumi et al.	434/307 A
5,947,746	*	9/1999	Tsai	434/307 A
5,953,005	*	9/1999	Liu	434/307 A
6,069,310	*	5/2000	James	84/645

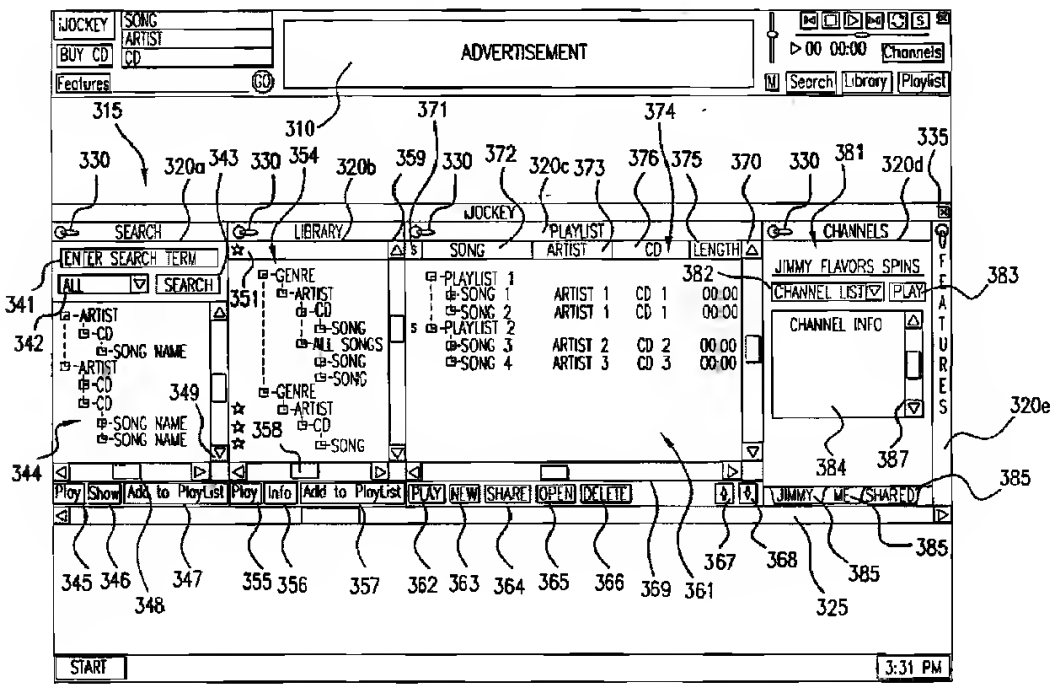
* cited by examiner

Primary Examiner—Stanley J. Witkowski
(74) *Attorney, Agent, or Firm*—Long Aldridge & Norman, LLP

(57) **ABSTRACT**

A system and method for delivering multimedia content to computers over a computer network, such as the Internet, includes a novel media player which may be downloaded onto a user's personal computer. The media player includes a user interface which allows a listener to search an online database of media selections and build a custom playlist of exactly the music selections desired by the listener. The multimedia content delivery system delivers advertisements which remain visible on a user's computer display screen at all times when the application is open, for example, while music selections are being delivered to the user. The advertisements are displayed in a window which always remains on a topmost level of windows on the user's computer display screen, even if the user is executing one or more other programs with the computer.

20 Claims, 11 Drawing Sheets



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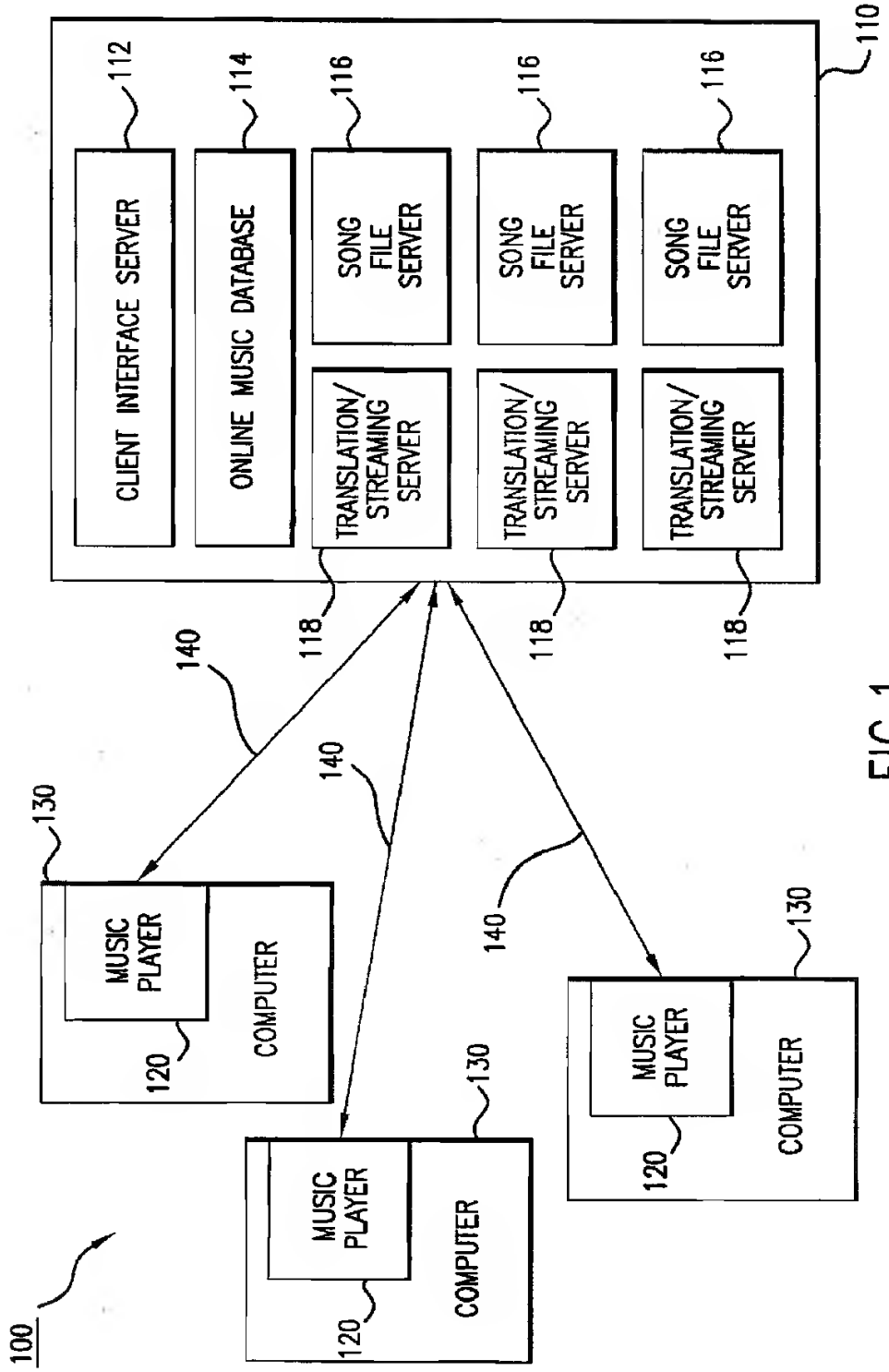

FIG. 1

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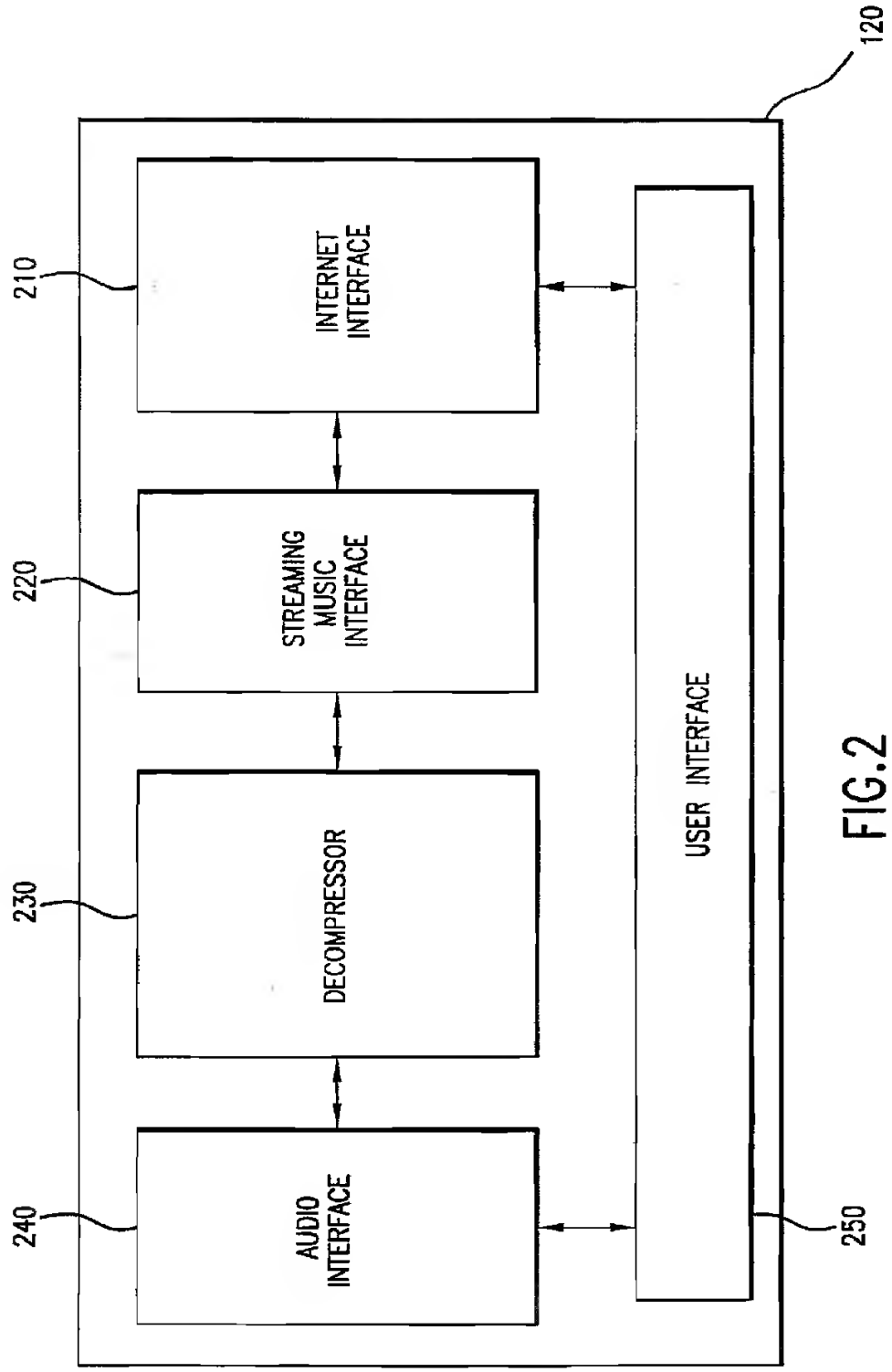

FIG.2

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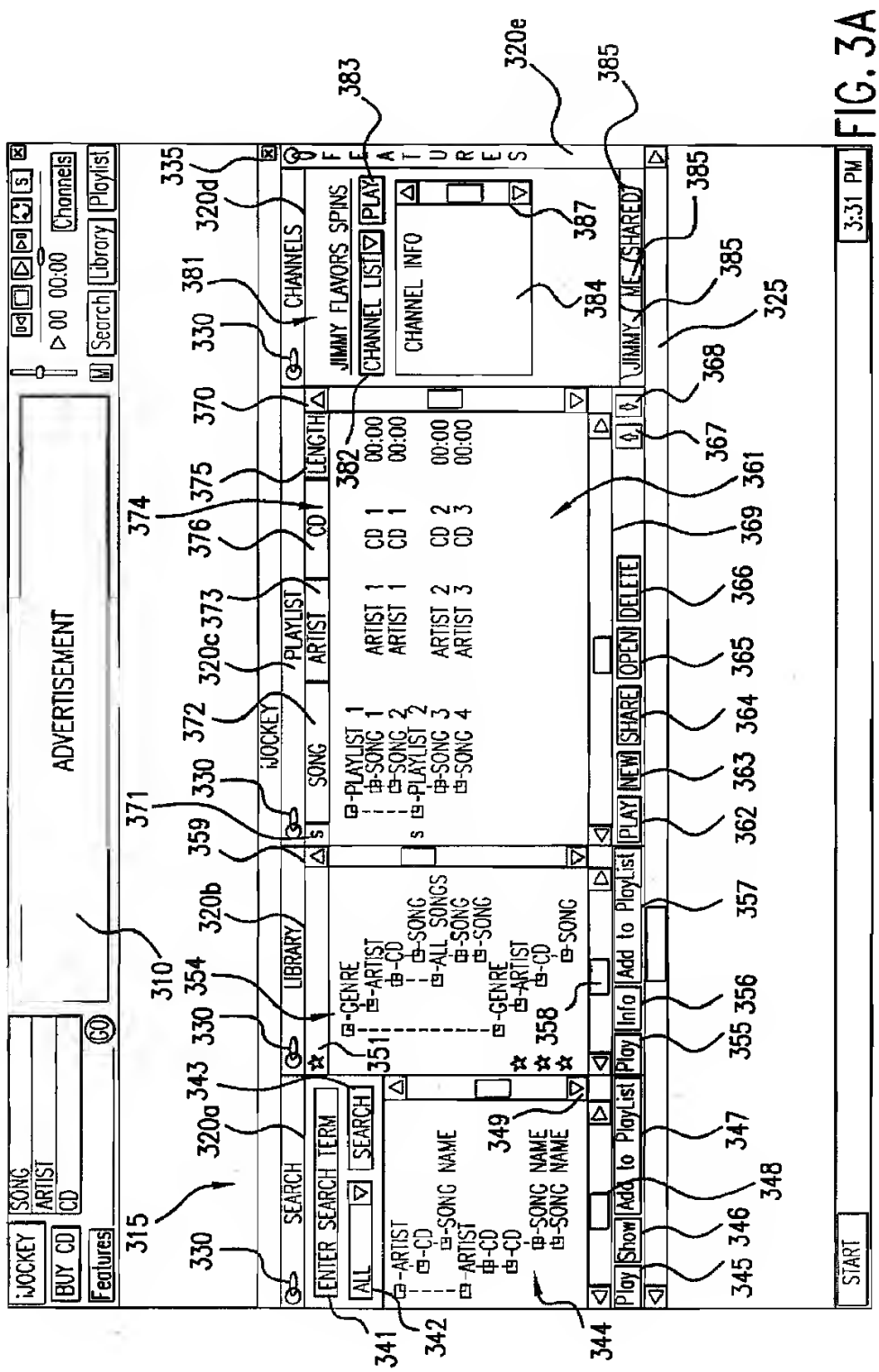

FIG. 3A

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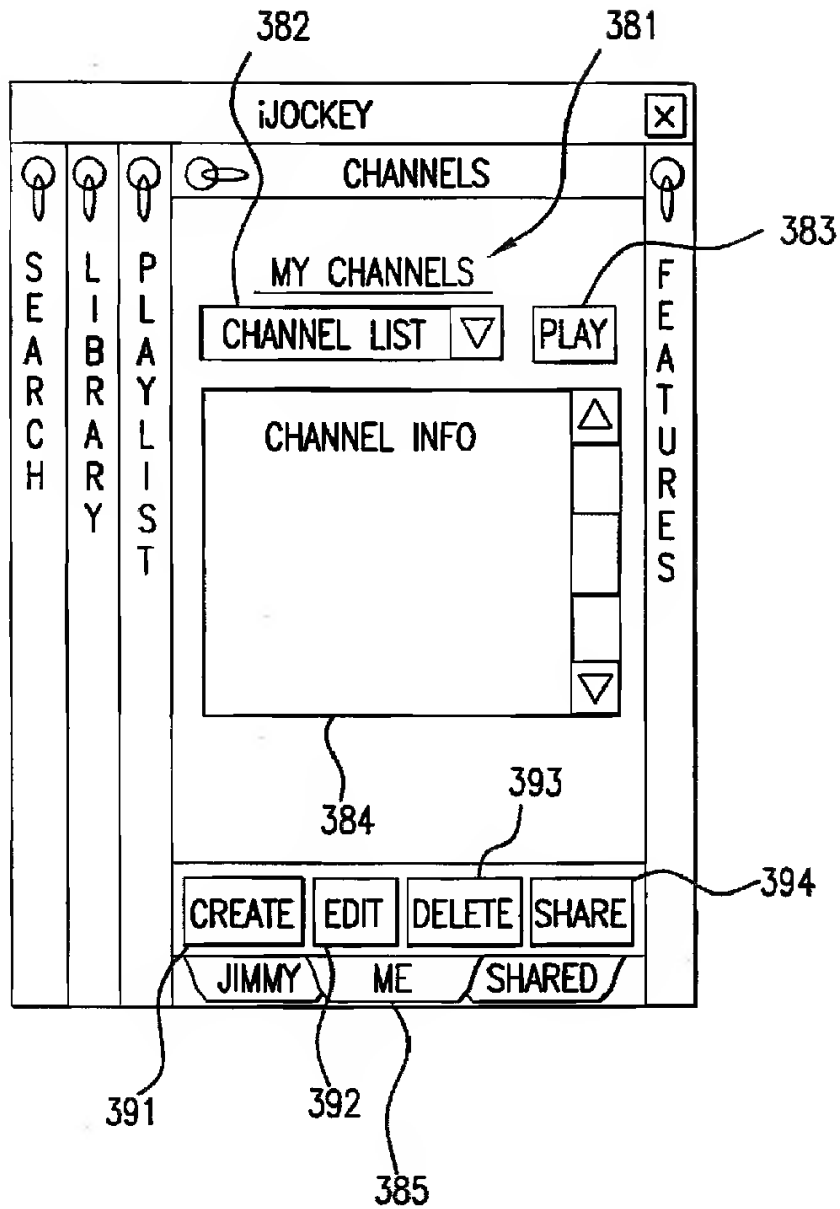

FIG. 3B

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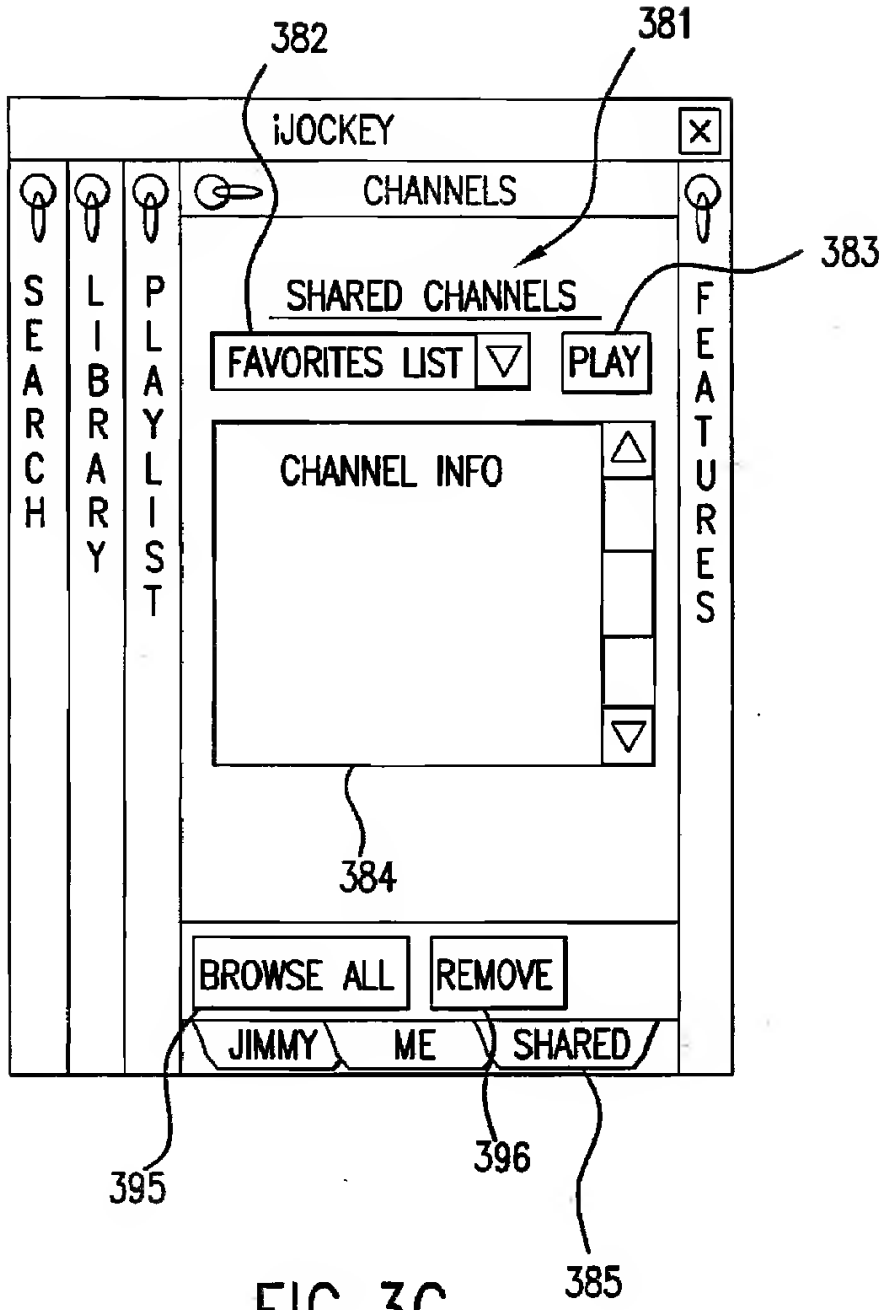

FIG. 3C

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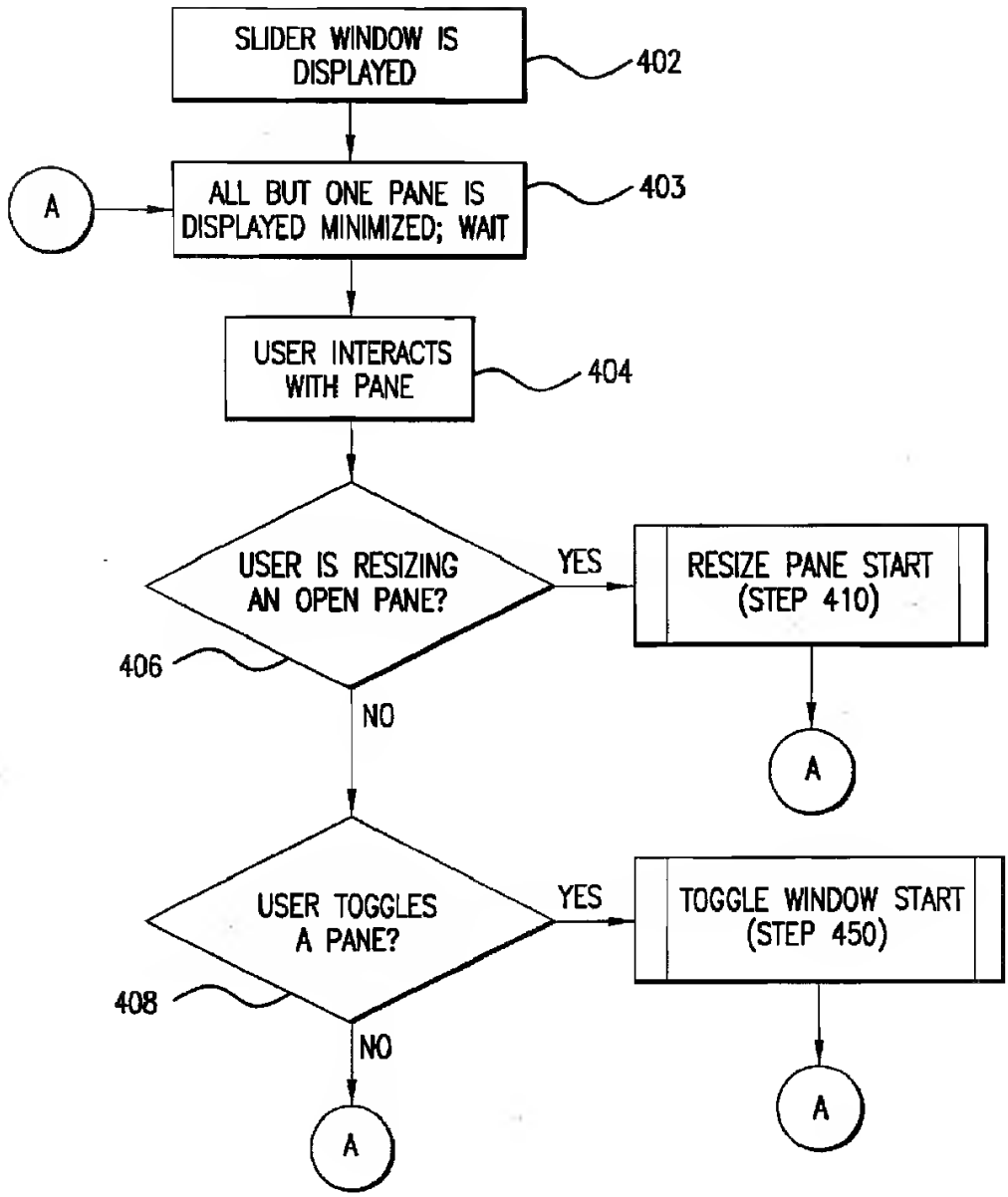

FIG. 4A

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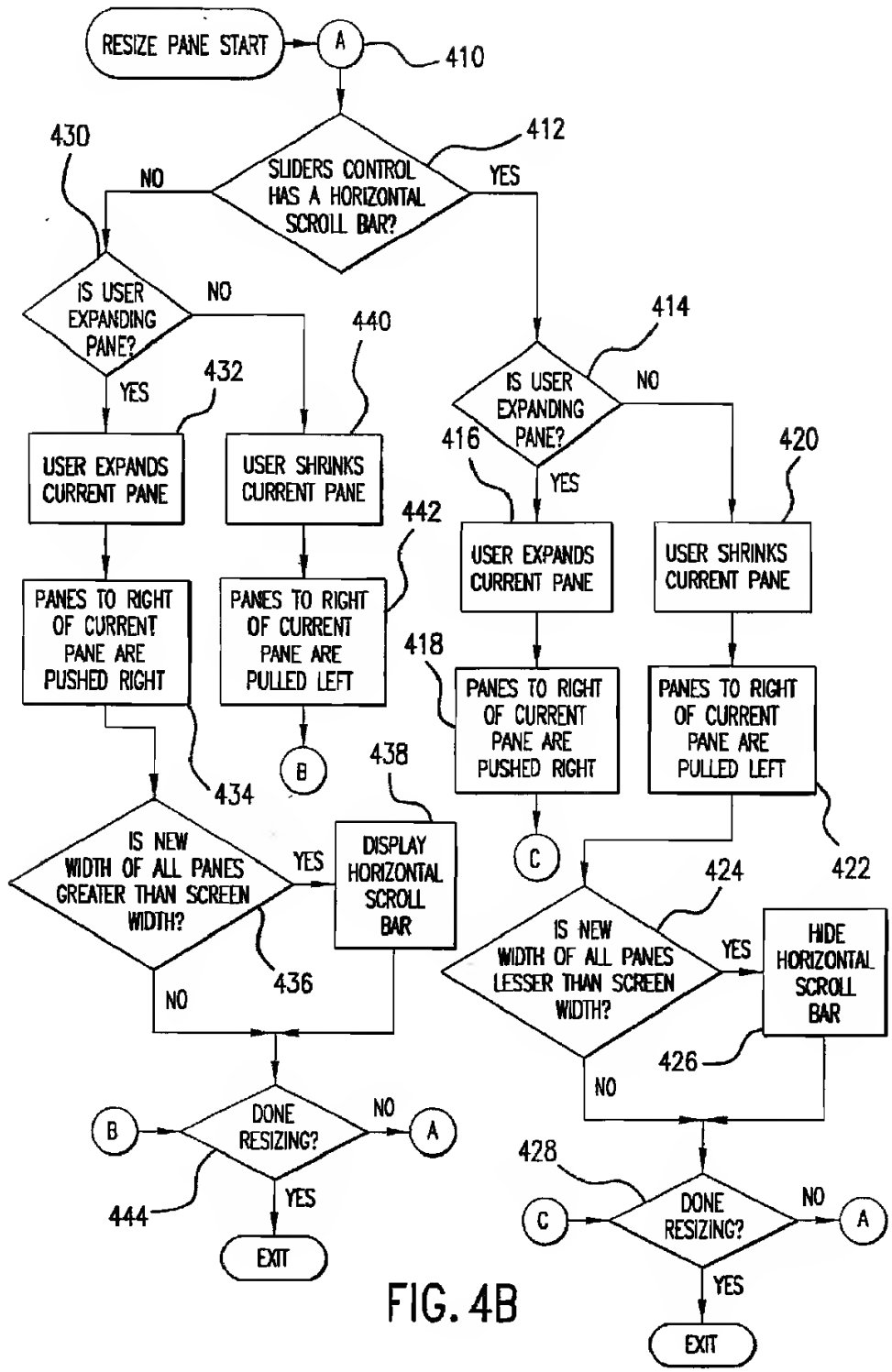

FIG. 4B

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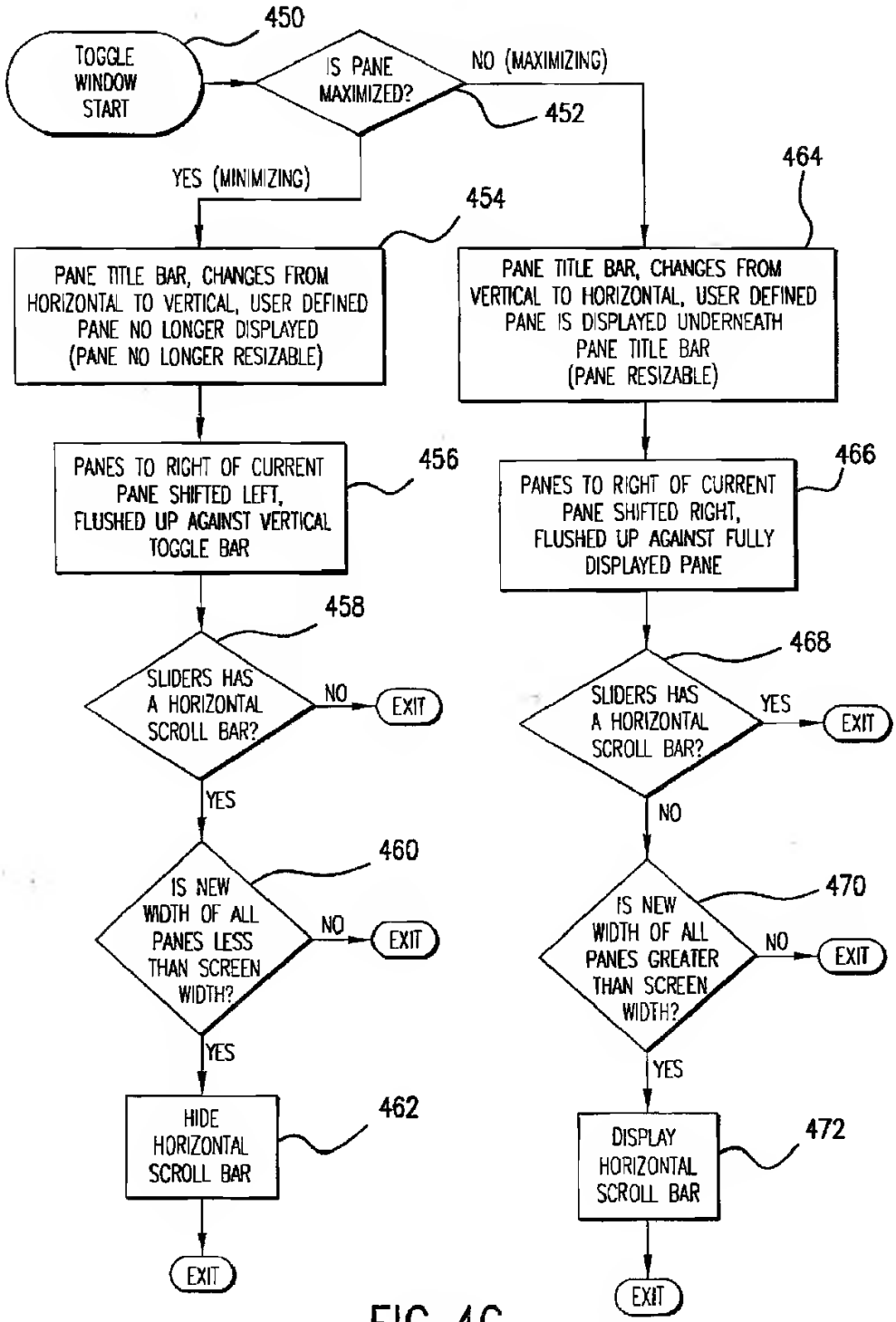

FIG. 4C

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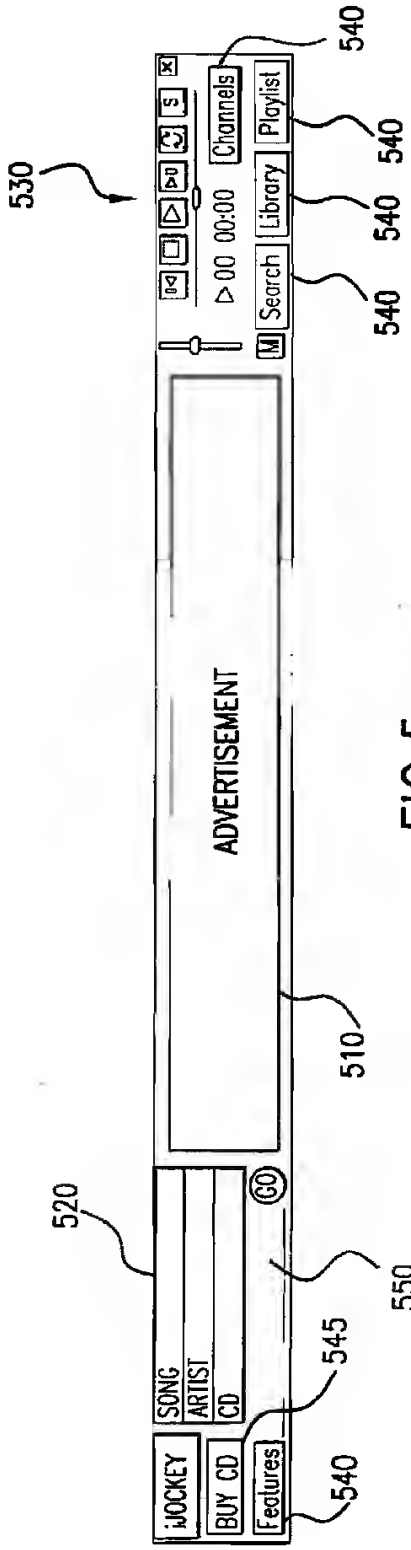

FIG.5

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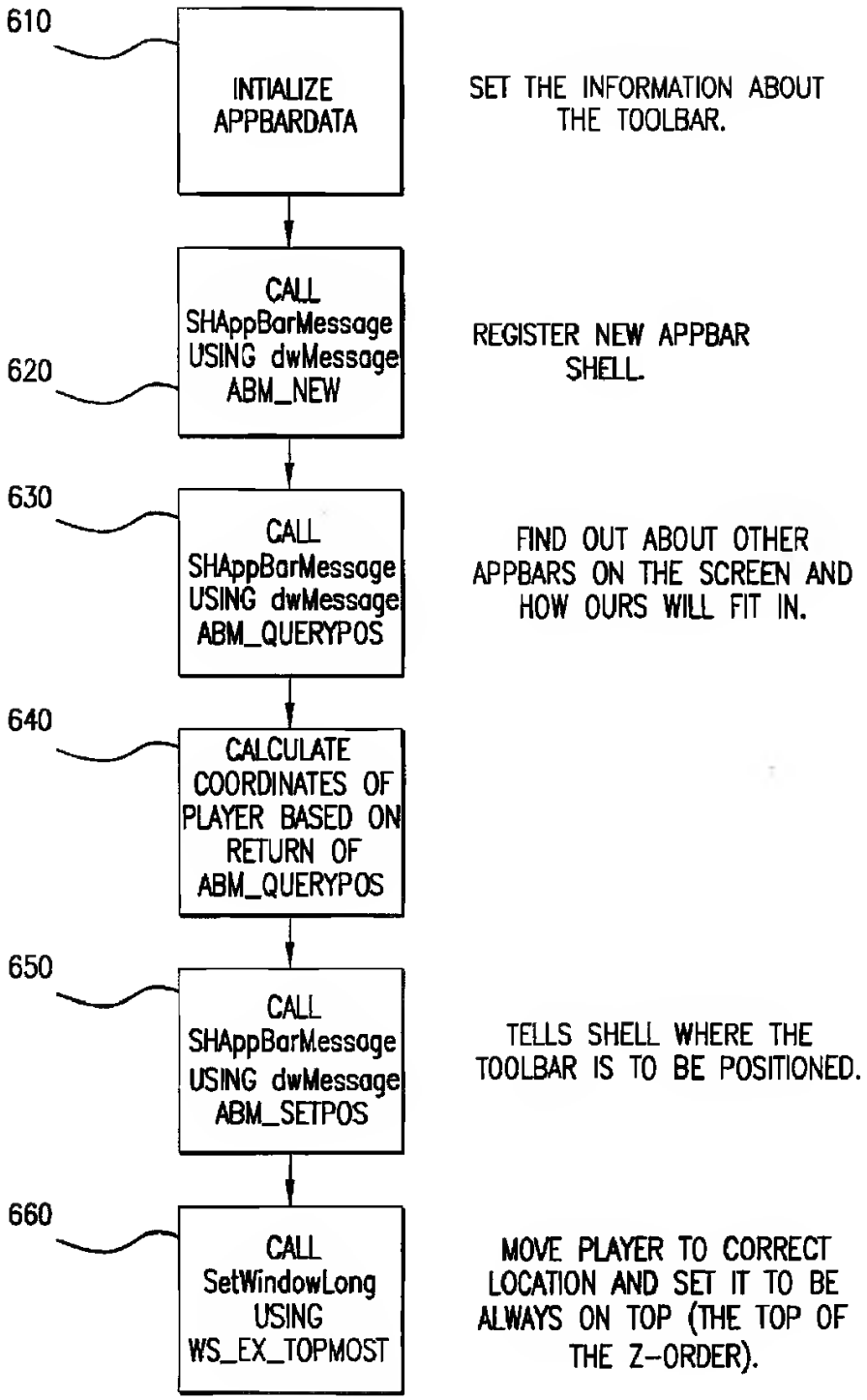

FIG. 6A

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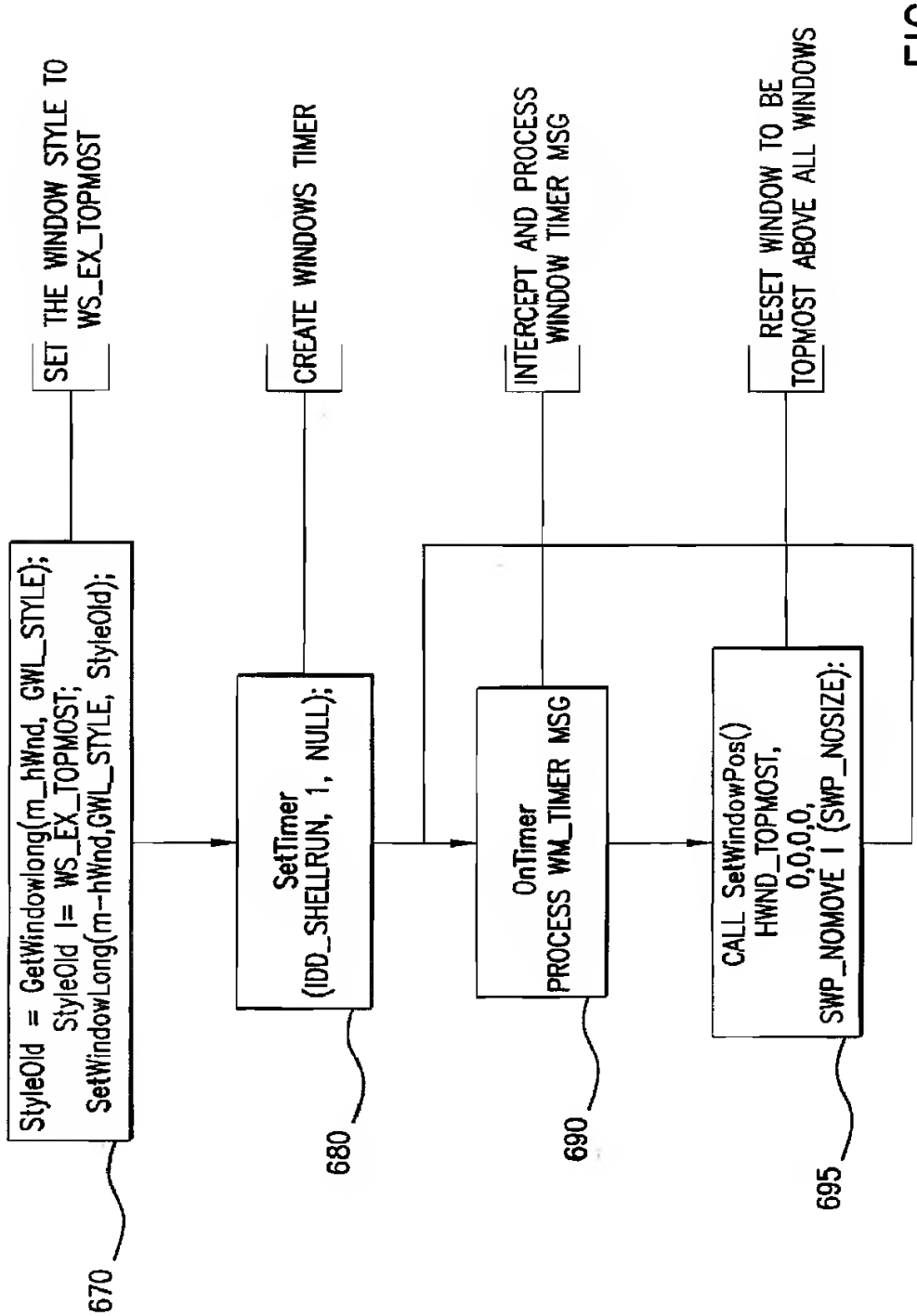

FIG. 6B

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MULTIMEDIA CONTENT DELIVERY SYSTEM AND METHOD

BACKGROUND OF THE INVENTION

1) Field of the Invention

This invention pertains to the field of multimedia content distribution, and more particularly, to a system and method for delivering multimedia content from a central database or repository to remotely distributed users over a network, such as the Internet.

2) Description of the Related Art

Multimedia applications have become an important driver for the growth of both the personal computer market and the Internet, indicating their popularity with users. It is apparent that many people enjoy listening to music or watching video programs via their computers, either in a standalone mode or, often, while performing other functions with the computer.

In the office environment, an increasing number of people work with a personal computer (PC). In that case, while working at their computers some workers may play music selections from a compact disc (CD), using the CD-ROM drive and audio processing components present in most new PCs. Also, someone working at home on their personal computer may listen to music while they work. Moreover, as more home computers are equipped and connected with hi-fidelity speaker systems, people may use a home computer as a audio music system, even when they are not using the computer for any other purposes.

However, it is sometimes the case that a person wants to hear one or more particular songs for which they do not presently have a copy of the recording. Also, it is often the case that a person wants to hear one or more music selections from a particular recording before making a purchase decision. And sometimes an individual may just want to hear a collection of songs from one particular artist. In other words, listeners desire the freedom and flexibility to choose exactly what songs they hear, in the order they choose, and at times of their own choosing.

Of course radio stations play music selections to which an individual may listen. Some PCs are equipped with radio tuners so that an individual may listen to broadcast radio stations via his or her PC. Moreover, many broadcast radio stations also transmit their broadcast audio signal over the Internet. And other specialized "Internet radio stations" have been developed which transmit a radio-like audio signal over the Internet only from a web site to which listeners connect. Thus, individuals may listen to many radio stations via a personal computer which is connected to the Internet.

For example, one advertisement-sponsored Internet web site known to the inventors, SPINNER.COM, allows a computer user to select from and listen to multiple Internet radio stations each of which is tailored to a particular musical format. SPINNER.COM uses its own downloadable music player for listeners to connect over the Internet with streaming audio servers associated with the SPINNER.COM radio stations. SPINNER.COM earns revenue to support its music service from Internet "banner ads" which appear in the music player window. Although a user may set the SPINNER.COM music player to remain on a topmost level of windows displayed on the user's computer display screen, the user may also allow the SPINNER.COM music player to be minimized or covered with other open windows on a user's computer display screen, so that the advertisements may not actually be viewed by the listener. In other words, the display of advertisements on the user's computer display screen is fully within the user's control. So the value of the advertisements to the advertisers is diminished.

But with Internet radio stations, as with AM and FM radio stations, the songs which are played are chosen by a program director and can not be tailored to each individual listener's choices. Neither broadcast nor Internet radio stations meet the desire for total flexibility of music choice by a listener.

Other Internet music services have been developed which allow a listener more freedom to choose the music selections which he or she wants to hear. Internet music services such as RADIO SONICNET and RADIOMOI.COM allow a listener a limited capability to program his or her own "customized" radio station.

RADIO SONICNET allows a listener to select and rank musical artists and musical categories of interest to the listener to create a customized radio station. RADIO SONICNET then provides the listener with a list of musical artists whose music will be played on the radio station. Individual song selections, play frequency, and song order are all determined by the RADIO SONICNET music service without any direct listener control. To create a "custom" radio station, a listener interacts with musical preference forms supplied to his or her computer's existing Internet web browser over an Internet connection with the RADIO SONICNET web site. All songs are delivered from the RADIO SONICNET server(s) to the listener's computer over an Internet connection with the listener's web browser, and are played on the listener's computer by one or more plug-ins or helper applications associated with the web browser. RADIO SONICNET earns revenue to support its music service from Internet "banner ads" which are displayed in the listener's browser window on the user's computer display screen while music selections are streamed to his or her computer. However, the user's web browser may be minimized or covered with other open windows on the computer display screen, so that the ads may not be viewed by the user. So, once again, the value of the advertisements to the advertisers is diminished.

Meanwhile, RADIOMOI.COM allows a listener to search a database of available songs by song title, artist, etc., and to add particular songs to a playlist for a "custom" radio station for that listener. The database of songs is divided into non-interactive and interactive songs. Once the listener has completed his or her playlist, he or she must submit it to the RADIOMOI music service for approval. The music service then checks the playlist against a predetermined set of rules and informs the listener whether the playlist has been approved or rejected. A playlist of only interactive songs is automatically approved. If the playlist is approved, then the listener may request that the music service begin streaming the songs on the playlist to the listener's computer via the Internet. However, the playlist may be rejected by the music service for one or more reasons, such as having too many consecutive songs by a same artist or from a same album or CD recording. In that case, the listener must edit his or her playlist to conform to the RADIOMOI music service's rules or to contain only interactive songs.

To create a "custom" radio station with RADIOMOI, a listener interacts with song and artist selection forms supplied to his or her computer's existing Internet web browser over an Internet connection with the RADIOMOI.COM web site. All songs are delivered from the RADIOMOI.COM server(s) to the listener's computer over an Internet connection with the listener's Internet web browser, and are played on the listener's computer by one or more plug-ins or helper

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applications associated with the web browser. RADIO-MOI.COM earns revenue to support its music service from Internet "banner ads" which are displayed in the Internet browser window on the user's computer display screen while music selections are streamed to his or her computer. However, as with RADIO SONICNET, the user's web browser may be minimized or covered with other open windows on a user's computer display screen, so that the ads may not be viewed by the listener.

Accordingly, all of these previous multimedia delivery systems and methods suffer from several disadvantages. For example, none of the previous systems is well adapted to providing an effective advertisement vehicle to support a free Internet music service. In these previous systems, the music player or Internet browser through which the music is being delivered can be minimized or covered on a user's computer display screen by other windows which are open for other active programs. So any ads which are being delivered for display through the music player are not necessarily visible to the user and may not be viewed by the user. This diminishes the value of the advertisements to sponsors, and therefore reduces the amount a sponsor will pay to have the advertisement delivered. In turn, the reduced advertising revenues limit the available funds for purchasing music licensing rights, distribution bandwidth, hardware, and other resources for supporting a free Internet music service.

Accordingly, it would be advantageous to provide a system and method of multimedia content delivery over a computer network which provides increased value to advertisers. It would also be advantageous to provide a system and method of multimedia content delivery over a computer network which provides increased flexibility to users. It would still further be advantageous to provide such a system and method which can deliver multimedia content over the Internet. Other and further objects and advantages will appear hereinafter.

SUMMARY OF THE INVENTION

The present invention comprises a system and method for delivering multimedia content to computers over a computer network, such as the Internet.

In one aspect of the invention, a multimedia content delivery system includes a novel media player which may be downloaded onto a user's personal computer. The media player comprises a user interface which allows a user to search an online database of media selections and build a custom playlist.

In another aspect of the invention, a multimedia content delivery system delivers advertisements which remain visible on a user's computer display screen at all times while a music player is open on a computer user's computer display screen. The advertisements are displayed in a window which always remains on a topmost level of windows on the user's computer display screen even if the user is executing one or more other programs with the computer.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a functional block diagram of a preferred embodiment of an online music delivery system;

FIG. 2 is a functional block diagram of a music player;

FIGS. 3A–C show a preferred embodiment of a user interface for a music player;

FIGS. 4A–C are a flowchart of a process of opening, closing, sizing and resizing user interface panes in a user interface of a music player;

FIG. 5 is a player toolbar for a music player;

FIGS. 6A–B show a flowchart of a process for establishing and maintaining a user interface at a topmost window on a computer display screen.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

For ease of explanation, the preferred embodiments described herein pertain to the delivery of musical content from a central music library to a plurality of users via the Internet. Nevertheless, it will be understood that the invention is not limited to the delivery of music, but could be used to deliver video or other streaming multimedia content. Also, delivery does not have to occur via the Internet but could also be accomplished over an intranet or a dedicated dial-up network.

A preferred embodiment of an online music delivery system **100** is shown in FIG. 1. The online music delivery system **100** may be used by an online music provider to provide an online music service delivering music selections to one or more users. The online music delivery system **100** includes an online music library **110** and one or more music players **120** operating on one or more personal computers **130** connected to the online music library **110** via Internet connections **140**.

The online music library **110** preferably consists of a client interface server **112**, an online music database **114** of available songs or music selections, a plurality of song file servers **116** and a plurality of translation/streaming servers **118**.

The client interface server **112** provides an Internet home page through which a new user may establish a connection with the online music delivery system **100**. For example, a new user may register with the online music service and download an installation file for installing a copy of the music player **120** onto the user's computer. Also, the client interface server **112** may allow a user to access the online music database **114** of available music selections. In that case, the client interface server **112** interfaces with the music player **120** for allowing the user to browse or search the online music database **114** and to implement various features of the online music delivery system **100** as described in more detail below.

The online music database **114** lists all of the songs or music selections available through the online music delivery system **100**. Preferably, the online music database **114** indexes the music selections to allow users to access music in a variety of ways. For example, in a preferred embodiment, each music selection is indexed by song title, musical artist, album or compact disc (CD) title, one or more corresponding musical genres, and/or year the recording was made.

The song file servers **116** contain all of the song files available through the online music delivery system **100**. Preferably, each music selection is stored in an individual song file in a basic, uncompressed raw format. In that case, all translation, compression, and other formatting is performed by the translation/streaming servers **118** as described in more detail below.

The translation/streaming servers **118** provide the interface points for one or more users to access the music selections of the song file servers **116** through the user's music player **120**. The translation/streaming servers receive song files in a raw uncompressed format from the song file servers **116**, then compress the song files, and stream the compressed song files across the Internet connection **140** to the user's music player **120**.

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FIG. 2 shows a preferred embodiment of a music player **120**. Preferably, the music player **120** is downloaded from the online music library **110** across the Internet connection **140** to a user's computer when the user registers with the online music system **100**. The music player **120** has several components, including an Internet interface **210**, a streaming music interface **220**, a decompressor **230**, an audio interface **240**, and a user interface **250**.

When a user opens or launches the music player **120** which is resident on his or her computer, the Internet interface **210** establishes an Internet connection **140** between the user's computer and the online music library **110**. The Internet interface **210** may establish a connection with an online Internet service provider (ISP) through which the Internet interface **210** is connected by a TCP/IP or UDP connection with the online music library **110**. Preferably, the Internet interface **210** may include a dial-up dialog box to allow a user to specify his or her protocol, including for example an access number, for establishing an Internet connection **140** through an Internet Service Provider (ISP).

The streaming music interface **220** receives compressed song files as data packets from the Internet interface **210** and formats the data packets into a streaming compressed song file.

The decompressor **230** receives the streaming compressed song file from the streaming audio interface and decompresses the file on-the-fly to provide a song file in a general purpose format playable by the audio processing components of the personal computer.

The audio interface **240** interfaces the decompressed song file from the decompressor **230** to the audio processing components of the personal computer.

FIGS. 3A–C show a preferred embodiment of a user interface **250** for a music player **120**. As shown in FIG. 3A, the user interface **250** includes a player toolbar **310** and an interactive window **315** comprising one or more user interface panes **320**, one or more toggles or handles **330** associated with the user interface panes **320**, and a close panes box **335**.

In one embodiment, the user interface **250** may have a "lego-like" structure, such that a user may rearrange the appearance of various components on the user's computer display screen. For example, the user may grab and drag various panes appearing in the user interface to various areas of the user's computer display screen as desired by the user.

The player toolbar **310** comprises one or more tools allowing a user to interact with aspects of the online music delivery system **100**, preferably including user controls for controlling the audio playback of music selections delivered through the online music delivery system **100**. Other features of the player toolbar **310** will be described in more detail below with respect to the preferred embodiment shown in FIG. 5.

The user interface panes **320** within the interactive window **315** display various information to the user and allow the user to affect the operation of the music player **120**. In a preferred embodiment, the user interface panes **320** include a search pane **320***a*, a library pane **320***b*, a playlist pane **320***c*, a channels pane **320***d*, and a features pane **320***e*. The user interface panes **320** may be closed by a user by selecting or "clicking" the close panes box **335**.

One or more of the user interface panes **320** may be displayed at a given time, depending upon the state of the associated handles **330**. A user interface pane **320** may be displayed or hidden by a user selecting or "clicking" on the associated handle **330**. Preferably, when the associated handle **330** is in a first "open" position (i.e., when the lever icon is horizontal) then the corresponding user interface pane **320** is displayed to the user. When the handle is in a second "closed" position (i.e., when the lever icon is vertical) then the corresponding user interface pane **320** is minimized. Further details regarding the operation of the handles **330** and the display of the user interface panes **320** will be described below with respect to FIG. 5.

In a preferred embodiment, the search pane **320***a* includes a search terms entry box **341**, a search parameter selection box **342**, a search button **343**, a search results display subpane **344**, a play button **345**, a show selection button **346**, an add button **347**, and horizontal and vertical scrollbars **348**, **349**.

The search pane **320***a* provides an interface with the client interface server **112** for allowing the user to browse or search the online music database **114** to locate a particular music selection which may be referenced by song title, artist, album or CD title, musical genre, etc. When the user wants to locate one or more music selections in the online music database **114**, he or she enters the search criteria into the search terms entry box **341** and selects a search category through the search parameter selection box **342**. Search criteria generally consist of keywords in a song's title, an artist's name, etc. Search parameters may include, for example, the song title, CD title, recording artist, or all of these parameters. The user activates the search by pressing, selecting or "clicking" on the search button **343**, through depressing a mouse button, for example.

When the search button **343** is selected, the music player **120** communicates a search request across the Internet connection **140** to the online music library **110**. The online music library **110** performs a search of the online music database **114** and returns search results across the Internet connection **140** to the music player **120**. All music selections which satisfy the search criteria are displayed in the search results display subpane **344**.

In a preferred embodiment, the search parameter selection box **342** includes an Internet search category for searching the Internet for song files. When the user selects the Internet search category and activates the search button **343**, the music player **120** communicates a search request across the Internet connection **140** to the online music library **110**. In that case, the online music library **110** includes or is linked to an Internet search engine which performs a search of the Internet for song files matching the search criteria. The online music library **110** returns the search results across the Internet connection **140** to the music player **120**. All song files which are found by the search engine which the satisfy the search criteria are displayed in the search results display subpane **344**.

At that point, the user may highlight a music selection in the search results display subpane **344** and select the play button **345**. If the user selects the play button **345**, then the music player **120** will transmit a request to the online music library **110** to begin streaming the corresponding compressed song file immediately across the Internet to the music player **120**. Upon receiving the compressed streaming song file, the music player **120** will decompress the song file and play the music selection back through the user's computer.

Advantageously, in this way a listener may select any music selection available and play it at once, without any reference to any other music selections which are currently playing or which have previously been requested. That is, by searching for and playing music selections in an online

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music delivery system **100** according to the present invention, a listener is provided the total flexibility to select any songs from the music database to be played in any order as desired by the user.

Alternatively, if the user highlights one or more music selections in the search results display subpane **344** and selects the add button **347**, then the highlighted music selection(s) may be added to a playlist of music selections to be delivered to the user's music player **120**. At this point, the playlist pane **320***c* is opened (if it was closed) and the user selects a playlist to which the highlighted music selection(s) will be added, as described in more detail below.

Advantageously, in this way a listener may select any music selections available via the online music delivery system **100** and add them to one or more playlists in any order, without any reference to any other music selections which are already included in the playlist. That is, a listener or user is provided the total flexibility to select a list of any songs, or entire compact disc recordings, from the music database to be played in any order as desired by the listener.

If the user highlights a music selection in the search results display subpane **344** and selects the show selection button **346**, then the library pane **320***b* opens (if it was closed), displaying the highlighted music selection.

In a preferred embodiment, the library pane **320***b* includes a favorites button **351**, a database display subpane **354**, a play button **355**, an information button **356**, an add button **357**, and horizontal and vertical scrollbars **358**, **359**. Via the database display subpane **354**, the library pane **320***b* provides a hierarchical view into the online music database **114**.

In a preferred embodiment, at a topmost hierarchical level a list of musical genres is provided in the database display subpane **354**, for example, classical music, country music, show tunes, rock music, jazz music, etc. A list of subgenres may also be provided at a next topmost hierarchical level. for example, within the rock music genre, there may be several subgenres, such as oldies rock, classic rock, heavy metal, grunge rock, etc. At successive lower hierarchical levels, music selections may be classified by recording artist, CD or album title, and song title. A user may select or "click" on an expansion box to view or hide various hierarchical levels.

Upon browsing the online musical database **114** and locating one or more music selections of interest, a user may mark the music selection(s) for more easy retrieval in the future. In a preferred embodiment, the library pane **320***b* includes a favorites button **351** indicating the location of particular music selections which have been previously marked by the user.

In a preferred embodiment, the database display subpane **354** also shows a directory structure for one or more mass storage devices associated with the user's computer. Thus, the user may view and select one or more song files stored on the mass storage devices. Preferably, the music player **120** can retrieve and play music selections stored onto a mass storage device in a variety of compressed audio formats, such as MP3, REAL AUDIO®, LIQUID AUDIO™ etc. Also, the music player **120** may retrieve and play music selections stored on a compact disc, or downloaded onto a hard disk drive of a user's computer, in an uncompressed audio format.

Upon one or more music selections being displayed in the database display subpane **354**, the user may highlight a music selection and select the play button **355**. If the highlighted music selection is stored on a mass storage device of the user's personal computer, theo the music player **120** will retrieve and play the music selection. However, if the highlighted music selection is stored in the online music library **110**, then the music player **120** will transmit a request across the Internet **140** to the online music library **110** to begin streaming the corresponding compressed song file immediately across the Internet to the music player **120**. Upon receiving the compressed streaming song file, the music player **120** will decompress the song file and play the music selection back through the user's computer.

Advantageously, a listener may select any music selection available in the online music delivery system **100** and play it immediately, without any reference to any other music selections which are currently playing or which have previously been requested. That is, by browsing for and playing music selections in this way, a listener is provided the total flexibility to select any songs from the online music database **114** to be played in any order as desired by the listener.

Alternatively, if the user highlights one or more music selections in the database display subpane **354** and selects the add button **357**, then the highlighted music selection(s) may be added to a playlist of music selections to be delivered to the user's music player **120**. At this point, the playlist pane **320***c* opens and the user selects a playlist to which the highlighted music selection(s) will be added, as described in more detail below.

Advantageously, a listener may browse and select any music selections available and add them to one or more playlists in any order, without any reference to any other music selections which are already included in the playlist. That is, a listener is provided the total flexibility to select a list of any songs from the online music database **114** to be played in any order as desired by the listener.

If the user highlights a music selection in the database display subpane **354** and selects the info button **356**, then a dialog box appears on the computer display screen providing more information about the highlighted item. For example, if the highlighted item is a song title, the dialog box may reveal the song length, the year it was recorded, and/or other information of interest.

In a preferred embodiment, the playlist pane **320***c* includes a playlist display subpane **361**, a play button **362**, a new button **363**, a share button **364**, and open button **365**, a delete button **366**, up and down buttons **367**, **368**, and horizontal and vertical scrollbars **369**, **370**. The playlist pane **320***c* displays a list of all playlists which the user has saved, together with the music selections included in each playlist. The user may create, open, edit, delete, share, and play playlists via the playlist pane **320***c*.

The playlist display subpane **361** includes a shared column **371**, a playlist column **372**, and artist column **373**, a CD column **374**, and a length column **375**. The widths of each column in the playlist display pane **361** can be adjusted by dragging the corresponding column separator bar **376**. The playlist column **371** provides a hierarchical listing of all playlists which the user has saved. The upper hierarchical level includes a name for the playlist, and the lower hierarchical level includes a song title for each music selection included in the playlist. The music selections are shown in the order in which they will be played in the playlist, with the first music selection at the top and the last music selection at the bottom. For each music selection in the playlist, the artist column **373** provides the name of the recording artist, the CD column **374** provides the title of the CD or album which includes the music selection, and the length column **375** provides the time required for the music selection to play.

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A user may add songs to a playlist through the search pane **320***a* or the library pane **320***b* as described above. Preferably, the user may reorder the music selection within a playlist by either highlighting a music selection in the playlist display subpane **361** and dragging it to its desired location within the playlist, or by using the up and down buttons **367**, **368** to move the highlighted music selection up or down one place at a time. Preferably, the user may delete a music selection from a playlist by highlighting it in the playlist display subpane **361** and selecting the delete button **366**.

The user may play a highlighted playlist by selecting the play button **361**. Alternatively, in an optional embodiment, when the play button is selected the user may be given the choice to play the highlighted playlist immediately, to schedule a time for the playlist to be played in the future, or to create a queue of playlists to be played sequentially.

By creating and playing playlists of music selections in this way, a listener is provided the total flexibility to select any music selections from the online music database **114** to be played in any order as desired by the listener. In particular, a listener may create and play playlists consisting of an entire CD by one artist, or even several CDs from a same artist, played consecutively.

The user may create a new playlist by selecting the new button **363**. In that case, a dialog box is opened on the computer display screen and the user may enter a name for the new playlist. The user may delete a playlist by highlighting it in the playlist display subpane **361** and selecting the delete button **366**.

The user may also share a playlist by selecting the share button **364**. A shared playlist is a playlist which is stored at the online music library **110** and is accessible to all registered users of the online music system **100**. When the user elects to share a playlist by selecting the share button, a dialog box is opened on the computer display screen for the user to provide information about the playlist to be shared, such as the user's name or alias, the total playtime, musical theme, etc. When the user closes the dialog box, the music player **120** transmits the information together with the playlist across the Internet connection **140** to the online music library **110**. The shared column **371** of the playlist display subpane **361** indicates whether or not a playlist is shared.

A user may open and save a shared playlist by pressing the open button **365**. When the open button **365** is pressed, the music player **120** sends a request across the Internet connection **140** to the online music library **110** for all playlists which may be downloaded from the online music library **110**. Then, a new window is opened on the computer display screen showing the shared playlists available from the online music library **110**. At this point, the user may highlight a shared playlist to see the music selections included in the playlist. The user can save a shared playlist by selecting the new button **363**, or can play a shared playlist by selecting the play button **362**.

In a preferred embodiment, the channels pane **320***d* includes a channel title subpane **381**, a channel selection box **382**, a play button **383**, a channel display subpane **384**, two or more channel category tabs **385**, a horizontal scrollbar (not shown), and a vertical scrollbar **387**. Channels are analogous to radio stations, providing a continuous stream of music selections from the online music service system **100**. For each channel, music selections are played from a very long carousel. Although one or more music selections may repeat more frequently, the length of the total play cycle may be several days or longer. Moreover, in some cases music selections matching certain target criteria for a channel may be randomly selected and played in a channel.

In a preferred embodiment, the online music system **100** includes three different types of channels, namely, preprogrammed channels, user-defined channels, and shared channels. Preprogrammed channels are channels which are programmed by the online music provider to fit popular musical formats such as might exist on conventional broadcast radio. Music selections may be continuously added or removed from each preprogrammed channel. Whenever a user "tunes" to a preprogrammed channel, the user hears the music already in progress, much as if he or she tuned to a radio station. User-defined channels are created in response to a user's particular musical preferences. Preferably, the online music system **100** automatically creates user-defined channels in response to information provided by a user. Shared channels are channels of music delivered to a user which were created and then shared in response to particular musical preferences supplied by one or more other users. Channels will be described in more detail below.

When the preprogrammed channel category tab **385** is selected, the channel title subpane **381** includes a title (e.g., "Jimmy Flavors Spins") indicating that the preprogrammed channel category is active. A list of all preprogrammed channels appears in the channel selection box **382**. Information about the channel currently selected in the channel selection box **382** appears in the channel display subpane **384**. If a user highlights a channel then selects the play button **383**, then the music player **120** will send a request across the Internet connection **140** to the online music library **110** to begin immediately streaming the selected channel to the user's computer. The selected preprogrammed channel is played "in progress" as with a conventional broadcast radio program.

As shown in FIG. 3B, when the user-defined channel category tab **385** is selected, the channel title subpane **381** includes a title indicating that the user-defined channel category is active (e.g., "My Channels"). A list of all user-defined channels appears in the channel selection box **382**. Information about the user-defined channel currently selected in the channel selection box **382** appears in the channel display subpane **384**. If a user highlights a user-defined channel then selects the play button **383**, then the music player **120** will send a request across the Internet connection **140** to the online music database **114** to begin immediately streaming the selected user-defined channel to the user's computer.

As shown in FIG. 3B, when the user-defined channel category tab **385** is selected, the channel title subpane **381** includes four additional buttons: a create button **391**, an edit button **392**, a delete button **393** and a share button **394**.

A user may create a new user-defined channel by selecting the create button **391**. When the user selects the create button **391**, a dialog box is opened on the computer display screen for the user to enter his or her musical preferences for the channel, together with a channel name. The musical preferences are used to create parameters for the online music system **100** to automatically program the user-defined channel.

A user may edit an existing user-defined channel by selecting the edit button **392**. When the user highlights a user-defined channel and selects the edit button **392**, a dialog box is opened on the computer display screen showing the user-defined channel name and the musical preferences for the user-defined channel. The user may edit those preferences to change the musical format of the user-defined channel.

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A user may delete a user-defined channel by selecting the delete button **393**. When the user highlights a user-defined channel and selects the delete button **393**, the highlighted channel is deleted from the user-defined channel list.

A user may share a user-defined channel by selecting the share button **394**. A shared channel is a user-defined channel whose parameters are stored at the online music library **110** and which is accessible to all registered users of the online music system **100**. When the user elects to share a channel, a dialog box is opened on the computer display screen for the user to provide information about the channel to be shared, such as a channel name, the user's name or alias, musical theme, etc. When the user closes the dialog box, the music player **120** transmits the information together with the channel parameters across the Internet connection **140** to the online music library **110**.

As shown in FIG. 3C, when the shared channel category tab **385** is selected, the channel title subpane **381** includes a title indicating that the shared channel category is active. A list of a user's preselected favorite shared channels appears in the channel selection box **382**. Information about the shared channel currently selected in the channel selection box **382** appears in the channel display subpane **384**. If a user highlights a shared channel then selects the play button **383**, then the music player **120** will send a request to the online music database **114** to begin immediately streaming the selected shared channel to the user's computer. If the shared channel is active, i.e., another user is already listening to the shared channel, then the selected channel begins "in progress" as with a conventional broadcast radio program. If no other users are currently listening to the shared channel, then the selected channel begins at the start of its musical rotation.

Preferably, when a channel is being streamed to a user, the user may mark a music selection that is currently playing from the channel as a favorite to be accessed through the library pane **320***b*. Also, the user may add a music selection that is currently playing from the channel to a playlist in the playlist pane **320***c*.

As shown in FIG. 3C, when the shared channel category tab **385** is selected, the channel title subpane **381** includes two additional buttons: a browse button **395** and a remove button **396**. A user may add a shared channel to the favorite shared channels in the channel selection box **382** by selecting the browse all button **395**. When the user selects the browse all button **395**, a dialog box is opened on the computer display screen, listing all of the shared channels available through the online music system **100**. The user may highlight one or more shared channels and add them to the favorite shared channels. Conversely, when the user highlights a shared channel in the channel selection box **382** and selects the remove button **396**, the highlighted shared channel is removed from the favorite shared channels.

The features pane **320***e* preferably includes buttons which a user may select to implement a variety of special features of the online music delivery system **100**. For example, the features pane **320***e* preferably includes a "chat" button to allow a user to connect to one or more chat rooms hosted by the online music library **110**. The chat rooms may allow users listening to a same channel to discuss what they are hearing in real time. In that case, each preprogrammed channel may have an associated chat room. Shared channels may also have a chat room if so specified by the channel's originator.

The features pane **320***e* preferably includes a "skins" button to allow a user to create, or select a precreated, "skin" or custom appearance template for the user interface **250** of the music player **120**. By changing skins, a user can customize the size, shape, color, or other appearance features of the panes, handles, and buttons of the user interface **250**.

The features pane **320***e* preferably includes an "instant messaging" button for a user to send an instant message via the Internet to one or more users currently connected with the online music delivery system **100**. Preferably, the user may have a predefined list of users with which he or she may exchange instant messages.

The features pane **320***e* preferably includes a "ratings" button to allow a user to rate a music selection and/or to view the ratings of other users regarding music selections in the online music database **114**.

The features pane **320***e* preferably includes a "pay-per-listen" button to allow a user to order special pay-per-listen events, such as new recording releases, concerts, etc. When the user selects the "pay-per-listen" button, a dialog box is opened on the computer display screen listing upcoming "pay-per-listen" events and allowing the user to purchase one or more of these events.

As can be seen, numerous user interface panes **320** exist within the interactive window **315** and may be opened on the computer display screen. If too many user interface panes **320** are opened, then the interactive window **315** cannot fit onto the user's computer display screen. In that case, a horizontal scroll bar **325** appears in the interactive window **315** below the user interface panes **320** to allow the user to scroll across the interactive window **315**. Moreover, a user may not only open and close the user interface panes **320** with the handles **330**, but may also resize each user interface pane **320**.

FIGS. 4A–C show a flowchart of a preferred embodiment of a process which may be executed by a pane management computer program for opening, closing, sizing and resizing the display areas of the user interface panes **320** in the interactive window **315** for display on a computer display screen.

In a first step **402**, an interactive window **315** is displayed. At that time, all but one user interface pane **320** are minimized. Then, in a step **403**, the pane management program waits for user interaction.

Then, in a step **404**, a user interacts with a user interface pane **320**. In a step **406**, the pane management program determines if the user is resizing the user interface pane **320**. If so, then the pane management program executes a resize pane routine at a step **410**. If not, then in a step **408**, the pane management program determines if the user is toggling (opening or closing) the user interface pane **320**. If so, then the pane management program executes a toggle pane routine at a step **450**. If not, then the pane management program returns to the step **403**.

The resize pane routine begins at the step **410** as shown in FIG. 4B. In a next step **412**, the pane management program determines if the interactive window **315** includes a horizontal scroll bar **325**.

If the interactive window **315** includes a horizontal scroll bar **325**, then in a step **414**, the pane management program determines if the user is expanding the user interface pane **320**. If the user is expanding the user interface pane **320**, then in a step **416** the pane management program allows the user to expand the current user interface pane **320**. Then, in a step **418**, all of the user interface panes **320** to the right of the user interface pane **320** the user is expanding are pushed to the right. Then the pane management program proceeds to a step **428**.

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If interactive window **315** includes a horizontal scroll bar **325** and if the user is not expanding the user interface pane **320**, then in a step **420** the pane management program allows the user to shrink the current user interface pane **320**. Then, in a step **422**, all of the user interface panes **320** to the right of the user interface pane **320** the user is expanding are pulled to the left. Then, in a step **424**, the pane management program determines if the new width of all of the user interface panes **320** is less than the computer display screen width. If not, then the pane management program proceeds to the step **428**. If so, then the pane management program hides the horizontal scroll bar **325** in a step **426** before proceeding to the step **428**.

In the step **428**, the pane management program determines if the user is done resizing the user interface pane **320**. If not, then the pane management program returns to the step **410**. If so, then the pane management program exits the resize pane routine and returns to the step **403**.

If in the step **412** the pane management program determines that interactive window **315** does not include a horizontal scroll bar **325**, then in a step **430** the pane management program determines if the user is expanding the user interface pane **320**. If the user is expanding the user interface pane **320**, then in a step **432** the pane management program allows the user to expand the current user interface pane **320**. Then, in a step **434**, all of the user interface panes **320** to the right of the user interface pane **320** the user is expanding are pushed to the right. Then, in a step **436**, the pane management program determines if the new width of all of the user interface panes **320** is greater than the computer display screen width. If not, then the pane management program proceeds to the step **444**. If so, then the pane management program hides the horizontal scroll bar **325** in a step **438** before proceeding to the step **444**.

If the interactive window **315** does not include a horizontal scroll bar **325** and if the user is not expanding the user interface pane **320**, then in a step **440** the pane management program allows the user to shrink the current user interface pane **320**. Then, in a step **442**, all of the user interface panes **320** to the right of the user interface pane **320** the user is expanding are pulled to the left. Then the pane management program proceeds to a step **444**.

In the step **444**, the pane management program determines if the user is done resizing the user interface pane **320**. If not, then the pane management program returns to the step **410**. If so, then the pane management program exits the resize pane routine and returns to the step **403**.

The toggle pane routine begins at the step **450**. In a next step **452**, the pane management program determines if the user interface pane **320** is maximized.

If the user interface pane **320** is maximized, then in a step **454** the user interface pane **320** title bar changes from horizontal to vertical and the user interface pane **320** is no longer displayed. Then, in a step **456**, user interface panes **320** to the right of the current user interface pane **320** are shifted to the left against the vertical toggle bar or handle.

Next, in a step **458**, the pane management program determines if the interactive window **315** includes a horizontal scroll bar **325**. If not, then the pane management program exits the toggle pane routine and returns to the step **403**. If so, then the pane management program proceeds to a step **460** where it determines if the width of all of the user interface panes **320** is less than the computer display screen width. If the width of all of the user interface panes **320** is not less than the computer display screen width, then the pane management program exits the toggle pane routine and returns to the step **403**. If the width of all of the user interface panes **320** is less than the computer display screen width, then the pane management program proceeds to a step **462** wherein it hides the horizontal scroll bar **325** and then exits the toggle pane routine and returns to the step **403**.

If in the step **452**, the pane management program determines that the user interface pane **320** is not maximized, then in a step **464** the user interface pane **320** title bar changes from vertical to horizontal and the user interface pane **320** is displayed underneath the user interface pane **320** title bar. Then, in a step **466**, user interface panes **320** to the right of the current user interface pane **320** are shifted to the right.

Next, in a step **468**, the pane management program determines if the user interface panes **320** include a horizontal scroll bar **325**. If so, then the pane management program exits the toggle pane routine and returns to the step **403**. If not, then the pane management program proceeds to a step **470** where it determines if the width of all of the user interface panes **320** is greater than the computer display screen width. If the width of all of the user interface panes **320** is not greater than the computer display screen width, then the pane management program exits the toggle pane routine and returns to the step **403**. If the width of all of the user interface panes **320** is greater than the computer display screen width, then the pane management program proceeds to a step **472** wherein it displays the horizontal scroll bar **325** and then exits the toggle pane routine and returns to the step **403**.

FIG. **5** shows a preferred embodiment of a player toolbar **310** in the interactive window **315** of the music player **120**. The player toolbar comprises an advertisement component of the user interface **250**, as will be described in more detail below.

In a preferred embodiment, the player toolbar **310** is an application desktop toolbar according to the WINDOWS® operating system. In that case, the player toolbar **310** is automatically set to be a topmost desktop toolbar which remains on a user's computer display screen at all times regardless of other applications which may be open on the user's computer desktop. In other words, the player toolbar **310** is automatically set to be a topmost desktop toolbar on a z-order (z-axis) stack of desktop toolbars or windows on the display screen. Also, the player toolbar occupies a topmost or bottommost position (y-axis) on the user's computer display screen. All other open windows on the user's computer display screen are then "resized," or pushed up or down, to fit within in the remaining available display area on the user's computer display screen.

Minimally, the player toolbar **310** comprises at least one pane for displaying an advertisement or other information to a user, and one or more player controls. In a preferred embodiment, the player toolbar **310** includes an advertisement pane **510**, an information pane **520**, a player control pane **530**, and several user interface buttons **540**.

The advertisement pane **510** includes and displays advertisements. Preferably, the advertisements are delivered across the Internet from the online music library **110** to the music player **120**. The advertisements may be simple "banner ads" or may include picture images, animations, video, audio, or any combination thereof. Preferably, each advertisement had a display duration (e.g., 15 seconds, 30 seconds, etc.) after which it is replaced by a next advertisement. An advertisement display duration may be matched to the duration of a particular music selection which is played by the music player **120**.

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The advertisements may be targeted to a user or group of users, depending upon the music selections they choose to hear, and/or some combination of user demographics. Demographic information may be obtained from users when they subscribe to the online music delivery service. In a preferred embodiment, the advertisements may include tie-ins to particular music selections being played by the music player **120**. These may include concert tickets, albums, T-shirts, or other items associated with a particular artist whose music selection is being played. In that case, a user may "click" on an advertisement to open a web browser window where he or she may purchase an advertised product over the Internet.

The information pane **520** preferably includes information about a music selection currently being delivered to the user's computer via the online music delivery system **100**. The information may include a song title, an artist name, a CD or album title, etc.

The player control pane **530** preferably includes several player controls for music selections being played by the music player **120**. Preferably, the player controls include a play button, a stop button, a previous song button, a next song button, a repeat button, a shuffle button for randomly playing songs, a volume control bar, a balance control bar, an elapsed time/remaining time counter, an elapsed time bar, and an equalizer.

In a preferred embodiment, the player toolbar **310** includes several user interface buttons **540**, such as a search button, a library button, a playlist button, a channels button and a features button. If a user selects any of these user interface buttons **540**, the corresponding user interface pane **320** is opened and displayed on the computer display screen in the interactive window **315**.

Preferably, the player toolbar **310** includes a purchase button **545** to allow a user to purchase a CD or album which includes the music selection which is being played by the music player **120**. Additionally, the user may purchase a downloadable copy of a music selection by selecting the purchase button **545** while the music selection is being streamed to the user's computer.

Also, preferably, the player toolbar **310** includes an Internet search button **550** for allowing a user to perform an Internet keyword search. In that case, the online music delivery system **100** may include an Internet search engine for searching the Internet for web sites matching a user's selected keywords. Alternatively, the Internet search button **550** may provide a link to another Internet web site featuring an Internet search engine. In another alternative embodiment, the search button **550** may search directly into the online music database **114**.

In a preferred embodiment, the music player **120** operates on a computer with an operating system having a graphical user interface, for example the MACINTOSH® operating system or the WINDOWS® operating system. As is well known, in such an operating system a number of computer programs or applications may have user interfaces which are simultaneously displayed in separate windows on the computer display screen. When two or more windows are open, they may typically be resized to various sizes desired by the user. Also, a first window may be placed over a second window, thus covering or hiding some or all of the second window such that its contents are not displayed on the computer display screen and are therefore not visible to a computer user.

Advantageously, the player toolbar **310** and its associated advertisement pane **510** automatically remain visible on a user's computer display screen whenever the music player **120** is open and executing on the computer. There is no user control provided in the user interface **250** for a user to minimize or hide the player toolbar **310** on the computer display screen.

In an alternative embodiment, an advertisement component of the user interface **250** may comprise a "floating window" instead of the player toolbar **310**. In that case, a floating window remains visible on a user's computer display screen whenever the music player **120** is open. Unlike an application desktop toolbar, the floating window may be moved by a user to any position on the user's computer display screen, not just the topmost or bottommost position (y-axis) of the user's computer display screen. Also, unlike an application desktop toolbar, the floating window does not "resize" the screen for all other open windows. The floating window may therefore cover portions of other windows open on the user's computer display screen. Nevertheless, like the player toolbar, the floating window is automatically set to remain on a topmost z-order (z-axis) stack of windows displayed on the user's computer display screen, and cannot be minimized by a user or moved off of the user's computer display screen. There is no user control provided in the user interface **250** for a user to minimize or hide the floating window on the computer display screen.

Thus, the advertisement component of the user interface **250** insures that the advertisements always appear on the user's computer display screen as long as the music player **120** is open. This ensures that advertisements are always visible to a user while using the online music service. This in turn makes the advertisements more effective and valuable to advertisers, generating higher advertisement rates. The increased advertisement revenues allow the online music service provider sufficient revenue to procure rights to transmit music selections from many artists, to be played in any order desired by a user.

FIGS. **6A–B** show a flowchart of a preferred embodiment of a process which may be executed by a player toolbar display program to create and automatically maintain a player toolbar **310** on a "topmost" level window (z-axis) of a computer display screen running under the WINDOWS® computer operating system. The process automatically places the player toolbar **310** on the "topmost" level window (z-axis) of a computer display screen without any user involvement, and also automatically ensures that the player toolbar **310** remains on the "topmost" level window (z-axis) of a computer display screen despite efforts by a user to remove it therefrom.

In a first step **610**, the player toolbar display program initializes data regarding the player toolbar **310**. Next, in a step **620**, the player toolbar display program registers the player toolbar **310** with the shell of the computer's operating system program. Then, in a step **630**, the player toolbar display program retrieves information from the shell regarding other application desktop toolbars for other computer programs which are open on the computer display screen.

From this information, in a step **640**, the player toolbar display program calculates the coordinates (x/y axes) for the location of the player toolbar **310** to be displayed on the computer display screen. Then, in a step **650**, the player toolbar display program informs the shell of the computer's operating system where the player toolbar **310** will be displayed on the computer display screen. Next, in a step **660**, the player toolbar display program calls a subroutine to place the player toolbar **310** at the correct position (x/y axes) on the computer display screen and to make it the "topmost"

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window on the stack (z-axis) of windows displayed on the user's computer display screen. In other words, the player toolbar **310** is displayed such that it is not covered by any other window or application desktop toolbar on the computer display screen. The player toolbar display program displays the player toolbar **310** at either the very top or the very bottom position on the computer display screen. All other open windows on the user's computer display screen are resized, or pushed up or down, to fit within the remaining available area on the user's computer display screen.

In a step **670**, the player toolbar display program sets the window style for the player toolbar to be at the topmost position (z-axis) on the "stack" of windows on the computer display screen. Then, to insure that the player toolbar **310** maintains the topmost position on the stack of windows on the computer display screen, in a step **680** the player toolbar display program sets a timer to return a message when a predetermined time interval expires. Preferably, the predetermined time interval is set to a short enough duration to insure that the player toolbar **310** always appears to a user to be the topmost window. In a step **690**, the player toolbar display program sets a handle so that when the timer expires, the player toolbar display program will recognize the timer. Finally, in a step **695**, when the player toolbar display program receives the timeout message, the player toolbar display program calls a subroutine to again place the player toolbar **310** at the correct position on the computer display screen and to make it the "topmost" level window on the stack of windows displayed on the user's computer display screen. Then, the program returns to step **690** and repeats the loop. In this way, the player toolbar display program ensures that the player toolbar **310** remains at the "topmost" window on the stack of windows displayed on the user's computer display screen so long as the music player **120** is open.

In one embodiment, the player toolbar display program recognizes attempts by a user to cover the player toolbar **310** or to force the player toolbar **310** from being displayed on the "topmost" window on the stack of windows displayed on the user's computer display screen. In that case, the player toolbar display program displays a warning message to a user that the player toolbar must remain on the computer display screen at all times in order for the user to continue receiving music selections from the online music service provider. Optionally, after repeated attempts by a user to force the player toolbar **310** from being displayed as the "topmost" window on the stack (z-axis) of windows displayed on the user's computer display screen, the player toolbar display program may cause the music player to disconnect from the online music library, to stop playing music selections, and to close.

In an alternative embodiment where the user interface substitutes a floating window for the player toolbar, then the steps **670** through **695** of the above-described player toolbar display program may be used to create and automatically maintain the floating window on a "topmost" level window (z-axis) of a computer display screen running under the WINDOWS® computer operating system. The process automatically places the floating window on the "topmost" level window (z-axis) of a computer display screen without any user involvement, and also automatically ensures that the floating window remains on the "topmost" level window (z-axis) of a computer display screen despite any efforts by a user to remove it therefrom.

The user interface **250** may include other desirable features. For example, when a music selection is being delivered from the online music library **110** to the music player **120** and is being played through the user's computer, a special display scrolling window or "ticker" may be opened on the computer display screen wherein the song lyrics are scrolled. Also, the user interface **250** may include a control or button for allowing a user to "rip" a CD, that is, to copy music selections from a CD onto a hard disk drive in the user's computer.

While preferred embodiments are disclosed herein, many variations are possible which remain within the concept and scope of the invention. For example, although the preferred embodiment has been described in terms of an online music delivery system, the invention in its various aspects may be applied appropriately to an online video delivery system. Such variations would become clear to one of ordinary skill in the art after inspection of the specification, drawings and claims herein. The invention therefore is not to be restricted except within the spirit and scope of the appended claims.

What is claimed is:

1. A multimedia content delivery system for delivering multimedia content across a computer network to a user computer having a display screen, audio processing components, and an operating system supporting graphical user interfaces, the system comprising:

on online music library, comprising,

a song file server for storing song files, and

an online database of the song files, and

a music player resident on the user computer for accessing the online database via the computer network and selecting therefrom selected song files to be delivered across the computer network to the user computer,

wherein said music player includes a user interface displaying an advertisement on a topmost level of windows on the display screen at all times even when other computer programs are being executed by the user computer.

2. The system of claim **1**, wherein the online music library further comprises a translation/streaming server receiving the selected song files from the song file server and communicating the selected song files across the computer network to the user computer.

3. The system of claim **2**, wherein the computer network is the Internet, and wherein the music player further comprises.

an Internet interface for establishing an Internet connection between the user computer and the translation/streaming server;

a streaming music interface receiving the selected song files via the Internet, and

an audio interface for providing the selected song files to the audio processing components of the user computer to be played by the audio processing components of the user computer.

4. The system of claim **1**, wherein the user interface further comprises:

an interactive window comprising a plurality of user interface panes; and

a plurality of handles each associated with a corresponding one of the user interface panes for opening and minimizing the corresponding user interface panes.

5. The system of claim **4**, further comprising a close box for closing all of the user interface panes.

6. The system of claim **4**, wherein the interactive window comprises

a search pane for a user to search the online database,

a library pane for providing a hierarchical view of the song files in the database;

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a playlist pane for providing a list of song file playlists to the user; and

a channels pane providing a list of preprogrammed channels available through the online music library.

7. The system of claim 6, wherein the user interface further comprises a horizontal scroll bar which is displayed to a user when a width of open user interface panes exceeds a width of the display screen and which is not displayed to a user when the width of open user interface panes is less than the width of the display screen.

8. A method of delivering music to a user via a personal computer having a display screen and audio processing components, the method comprising:

displaying an advertisement on a topmost level of windows on the display screen at all times even when other computer programs are being executed by the personal computer;

providing an online music database of music selections;

displaying contents of the online music database to the listener via the display screen;

receiving from the user a list of selected music selections in the online music database; and

delivering the selected music selections to the personal computer.

9. The method of claim 8, further comprising playing the selected music selections through the audio processing components.

10. The method of claim 8, further comprising delivering to the personal computer lyrics for the selected music selections.

11. The method of claim 8, further comprising storing a playlist comprising the list of selected music selections.

12. The method of claim 8, further comprising receiving from the user a scheduled playtime for the selected music selections, and wherein the selected music selections are delivered to the personal computer at the scheduled playtime.

13. A music player for a computer having a display screen, audio processing components, and an operating system supporting graphical user interfaces, the music player comprising:

an Internet interface for establishing an Internet connection between the computer and an online music library;

a streaming music interface for receiving a song file from the online music library via the Internet;

an audio interface for providing the song file to the audio processing components of the computer to be played by the audio processing components of the computer; and

a user interface for user interaction with the music player, said user interface comprising,

an advertisement component for displaying an advertisement on the display screen, and

a display program for automatically setting said advertisement component to displayed in a topmost level of windows on the display screen at all times even when other computer programs are being executed by the computer.

14. The music player of claim 13, wherein the advertisement component comprises a floating window.

15. The music player of claim 13, wherein the advertisement component comprises a player toolbar.

16. The music player of claim 15, wherein the player toolbar comprises:

a player control pane including player controls for the song file being played by the music player; and

an advertisement pane for displaying the advertisement.

17. The music player of claim 13, wherein the song file received by the streaming music interface is a compressed song file, and wherein the music player further comprises a decompressor for decompressing the compressed song file.

18. The music player of claim 13, wherein the user interface further comprises:

an interactive window comprising a plurality of user interface panes; and

a plurality of handles each associated with a corresponding one of the user interface panes for opening and minimizing the corresponding user interface panes.

19. The music player of claim 18, wherein the interactive window comprises:

a search pane for a user to search an online database of song files in the online music library;

a library pane for providing a hierarchical view of the song files in the online database;

a playlist pane for providing a list of playlists to the user; and

a channels pane providing a list of pre-programmed channels available from the online music library.

20. The music player of claim 13, wherein the user interface further comprises a scrolling window for displaying lyrics corresponding to a song file being played by the music player.

* * * * *

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APPENDIX B

A copy of U.S. Patent No. 6,587,127 to Leeke et al.

US006587127B1

(12) **United States Patent**
Leeke et al.

(10) **Patent No.: US 6,587,127 B1**
(45) **Date of Patent: *Jul. 1, 2003**

(54) **CONTENT PLAYER METHOD AND SERVER WITH USER PROFILE**

(75) Inventors: **Steven D. Leeke**, Rolling Meadows, IL (US); **Gregory B. Mackintosh**, Naperville, IL (US); **Edward Stojakovic**, Chicago, IL (US)

(73) Assignee: **Motorola, Inc.**, Schaumburg, IL (US)

(*) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/198,732**

(22) Filed: **Nov. 24, 1998**

(Under 37 CFR 1.47)

Related U.S. Application Data

(63) Continuation-in-part of application No. 08/976,971, filed on Nov. 25, 1997, now abandoned.

(51) **Int. Cl.**[7] **G06F 3/00**

(52) **U.S. Cl.** **345/765**; 345/733; 345/747; 345/764

(58) **Field of Search** 345/700, 716, 345/733, 742, 744, 745, 747, 762, 764, 765, 866, 961, 962, 978; 707/500.1

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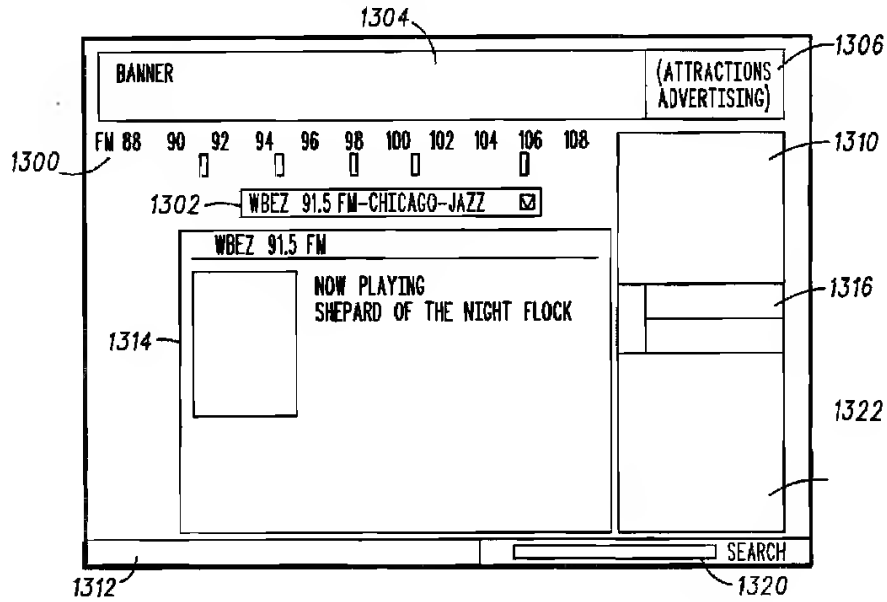
Primary Examiner—John Cabeca
Assistant Examiner—X. L. Bautista
(74) *Attorney, Agent, or Firm*—James E. Gauger; Hisashi D. Watanabe

(57) **ABSTRACT**

A method of operation of a server (**102**) interacting with users (**104, 106**) to provide personalized content to each of the users. Personalized content is sent to a first user by communicating first audio or other content associated with a broadcast to a first user location. Second content is selected and a first signal is communicated to the first user location dependent on the user profile. The second content can include second audio content selected in dependence upon the first user profile, in which case playback of the second audio content is synchronized with respect to playback of the first audio content.

20 Claims, 33 Drawing Sheets



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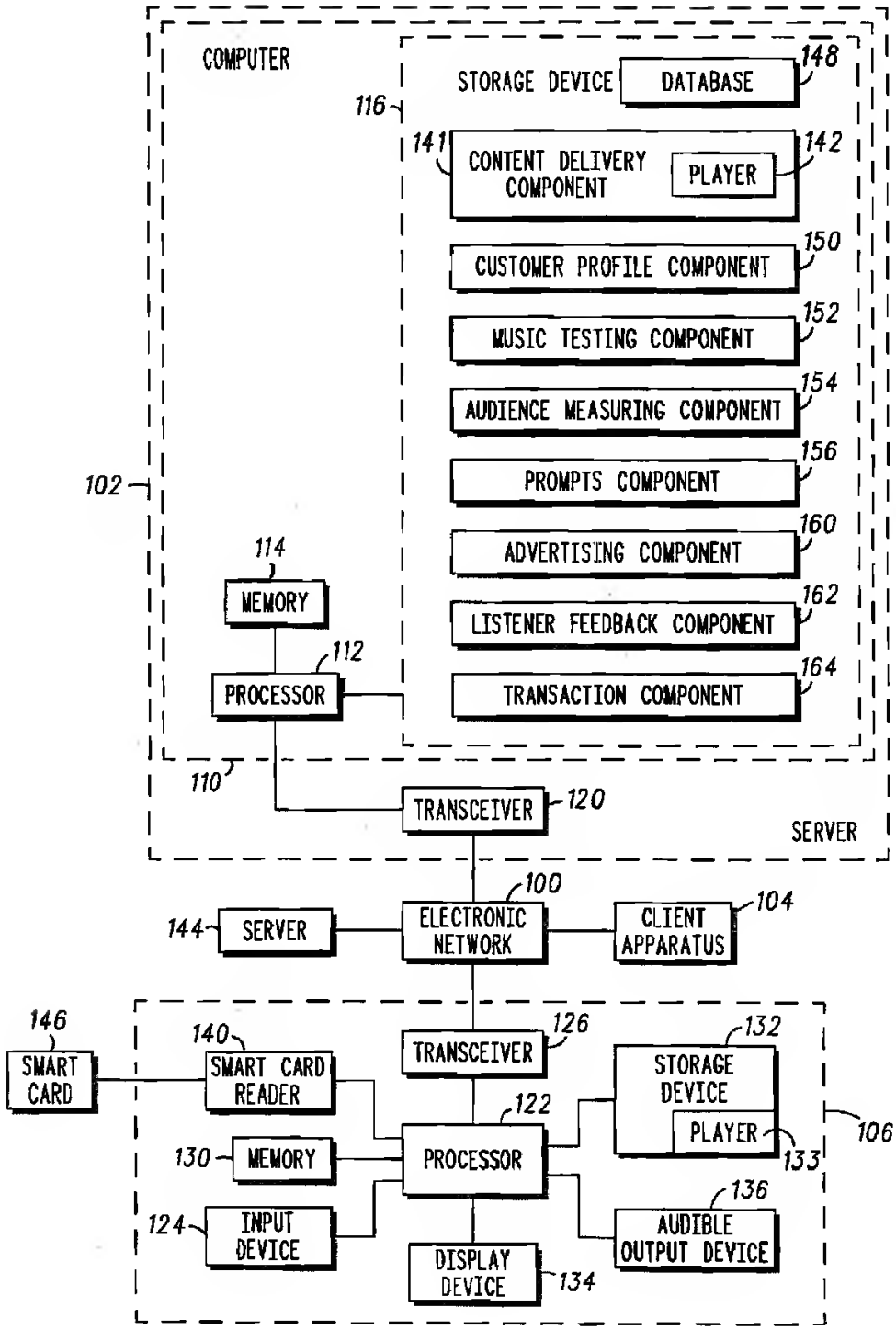

FIG. 1

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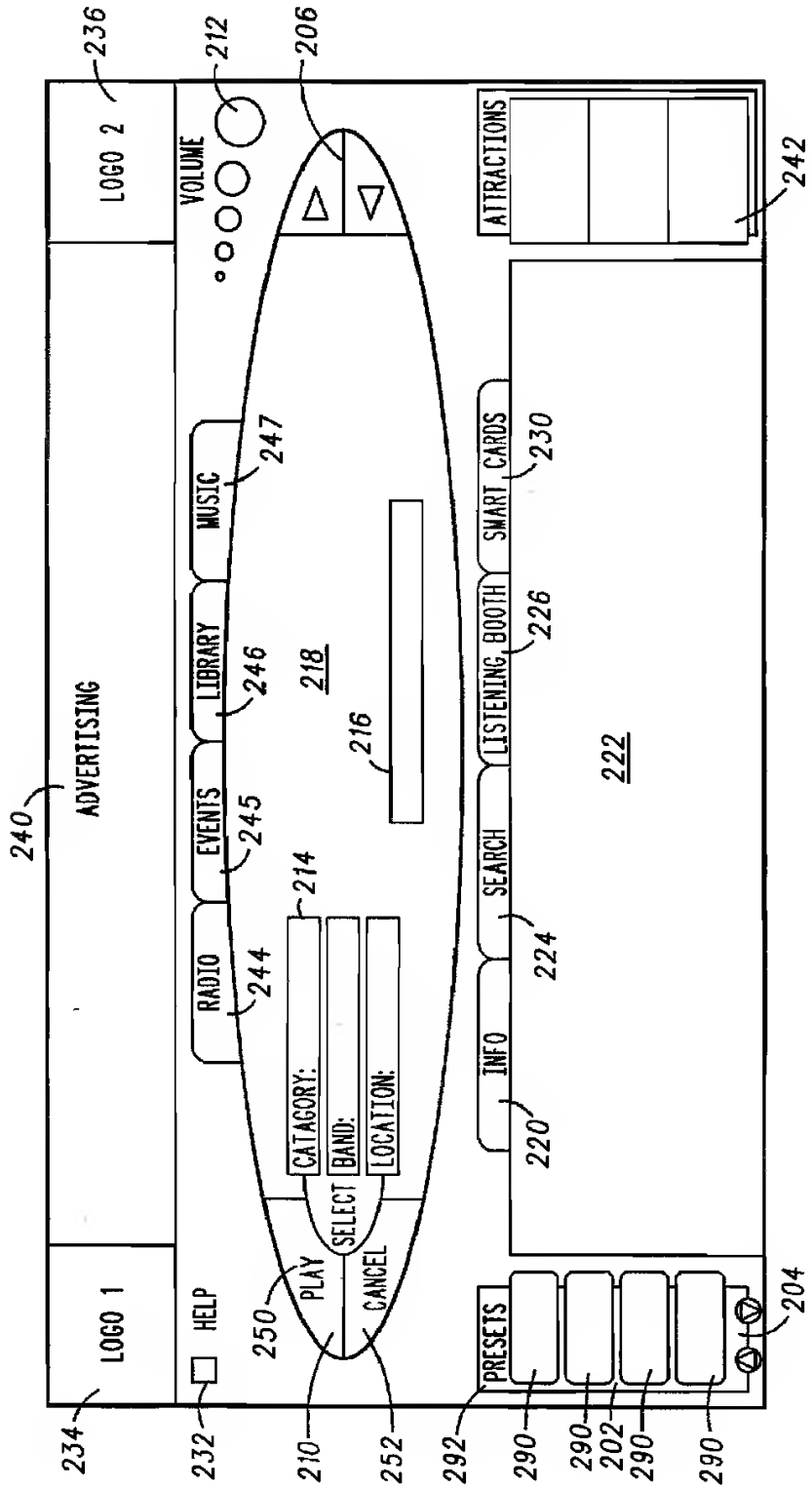

FIG. 2

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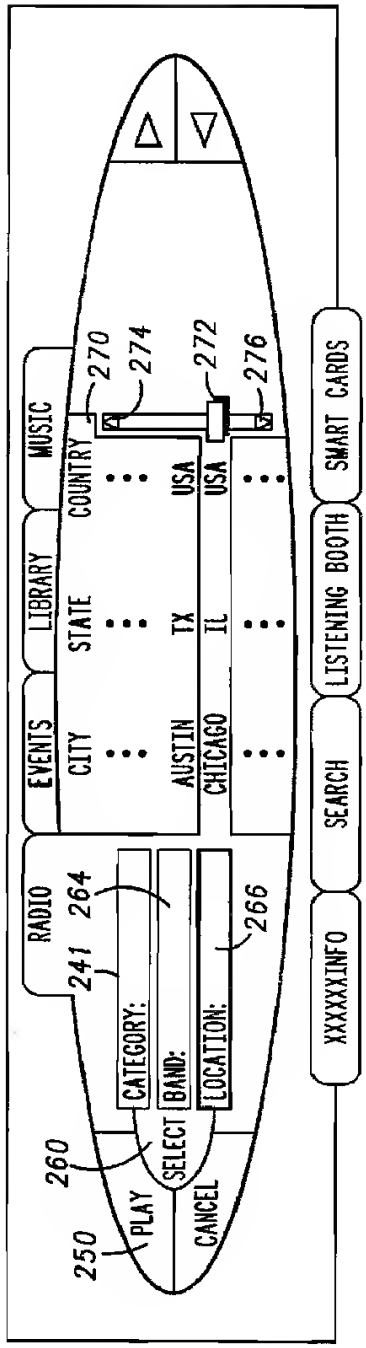

FIG. 3

FIG. 5

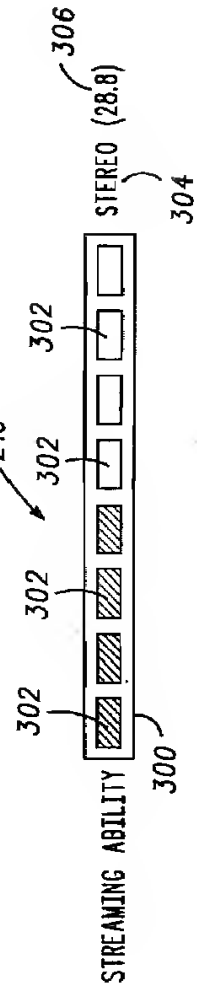

FIG. 4

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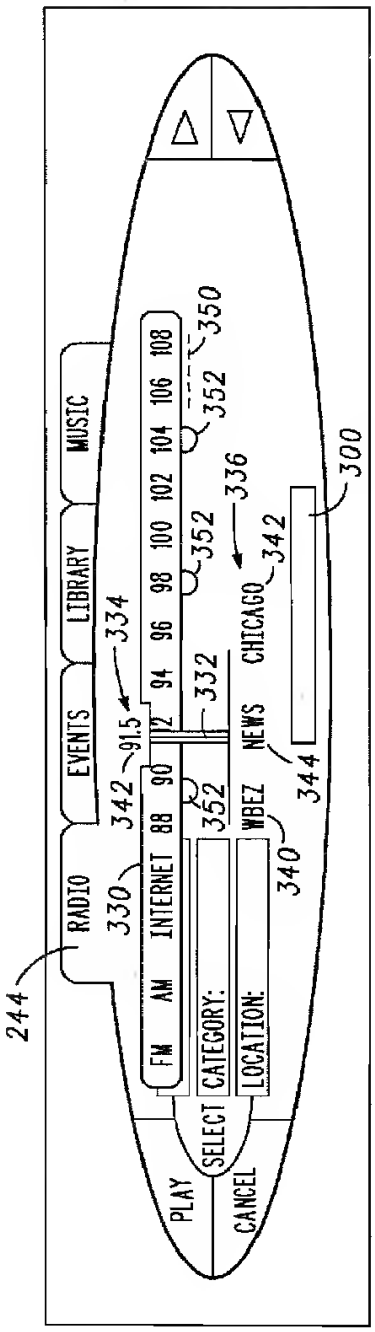

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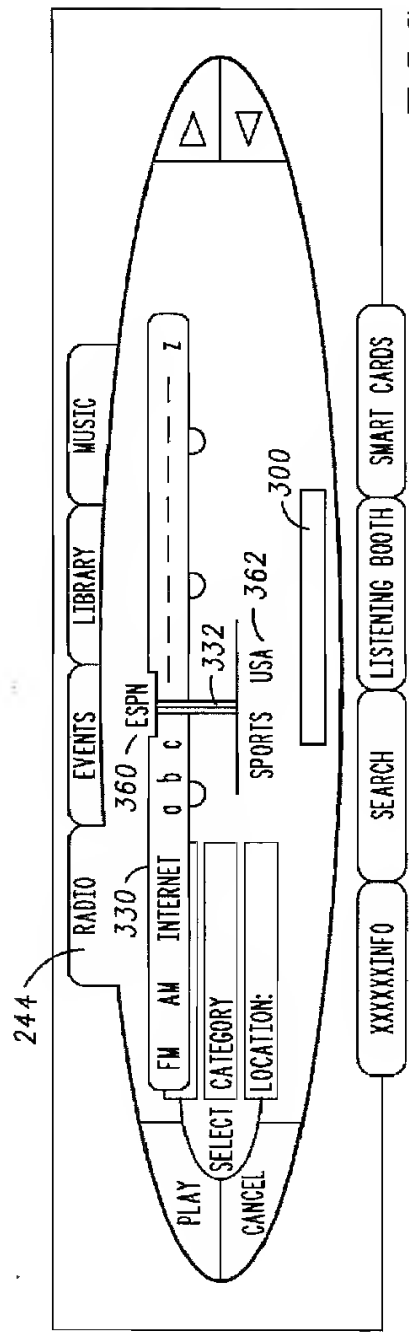

FIG. 7

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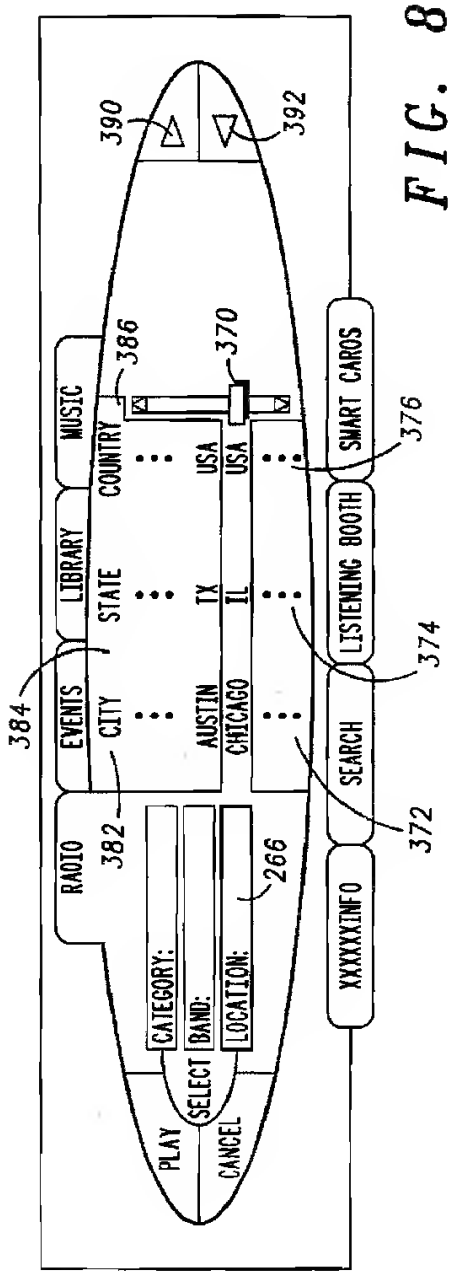

FIG. 8

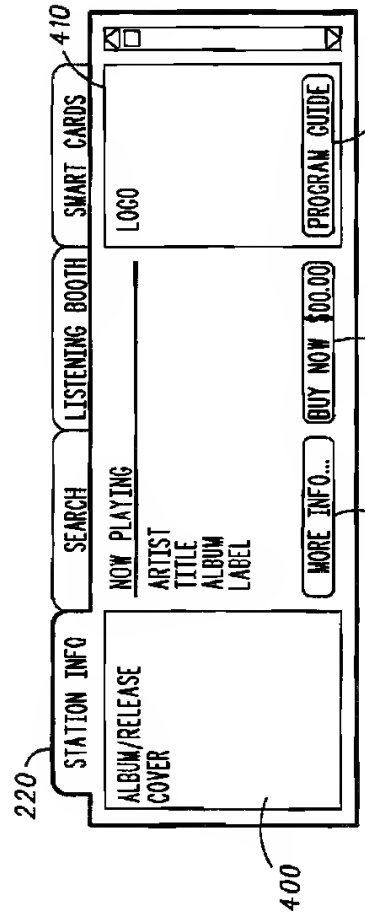

FIG. 9

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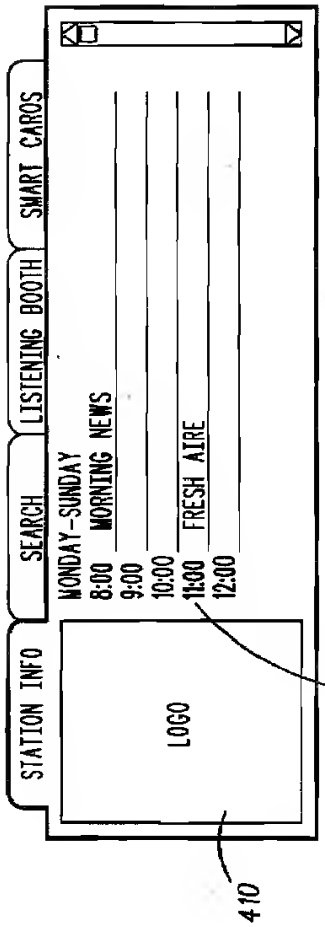

FIG. 10

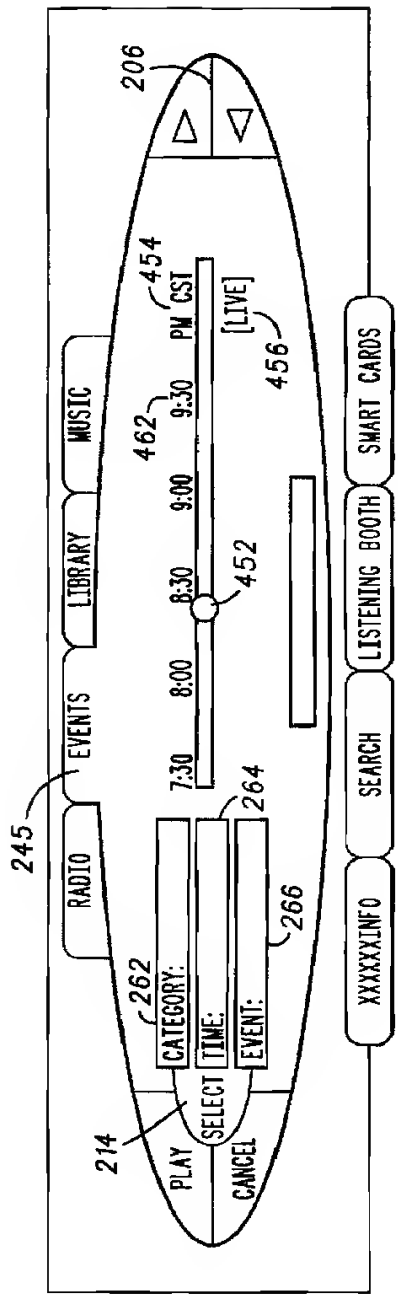

FIG. 11

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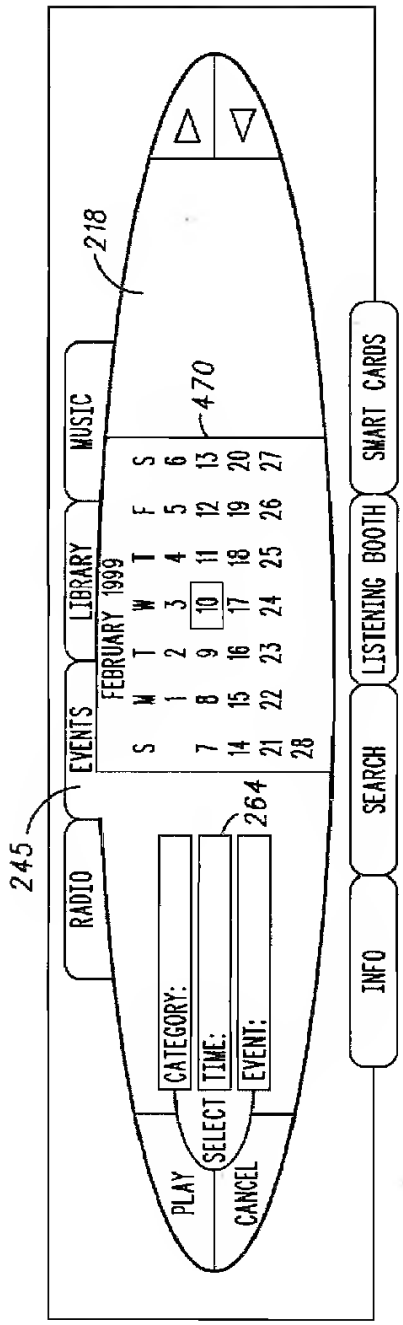

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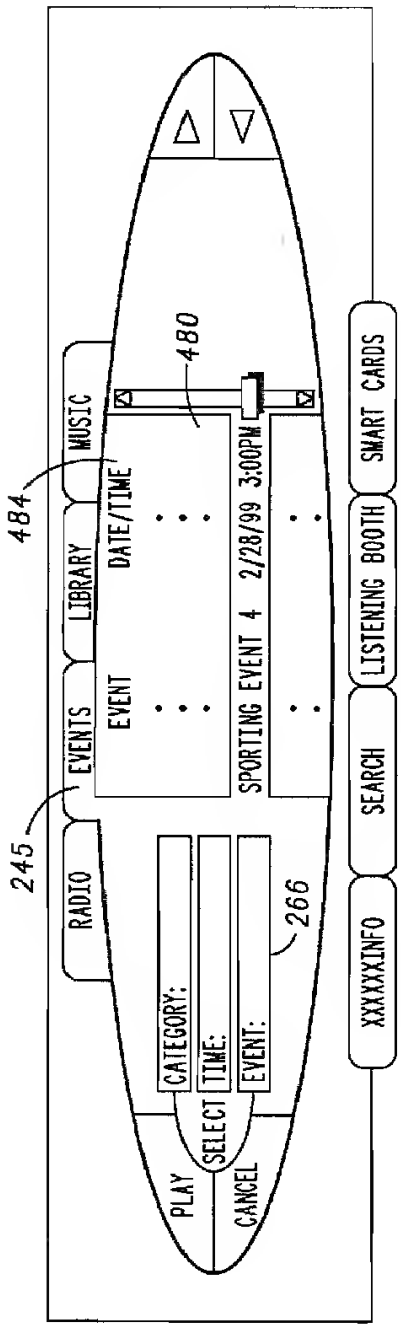

FIG. 13

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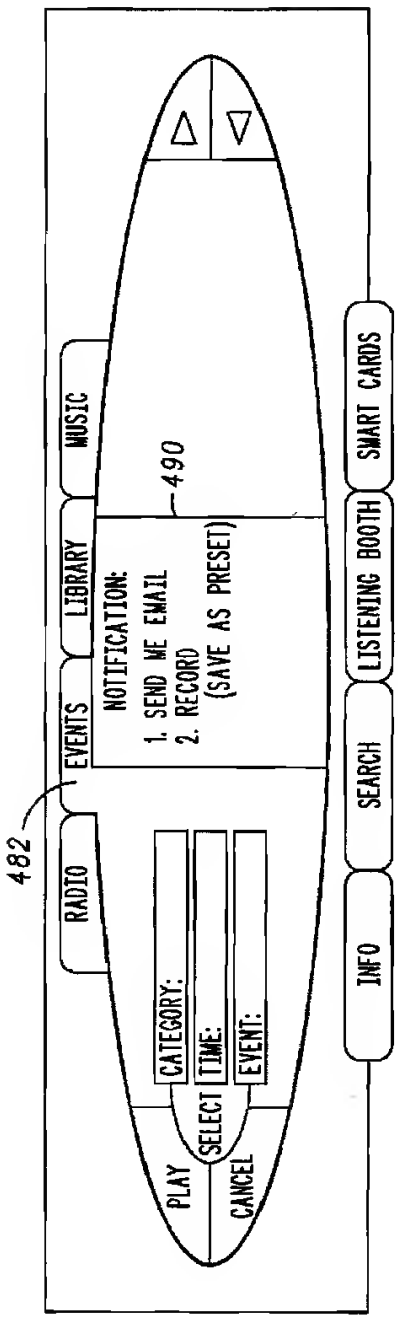

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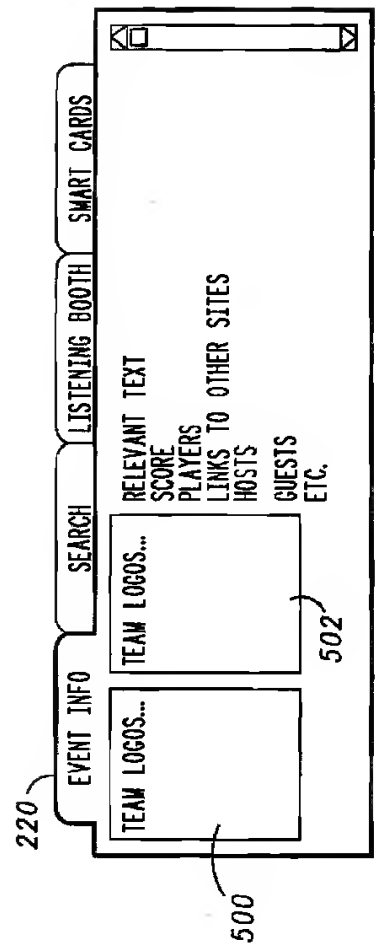

FIG. 15

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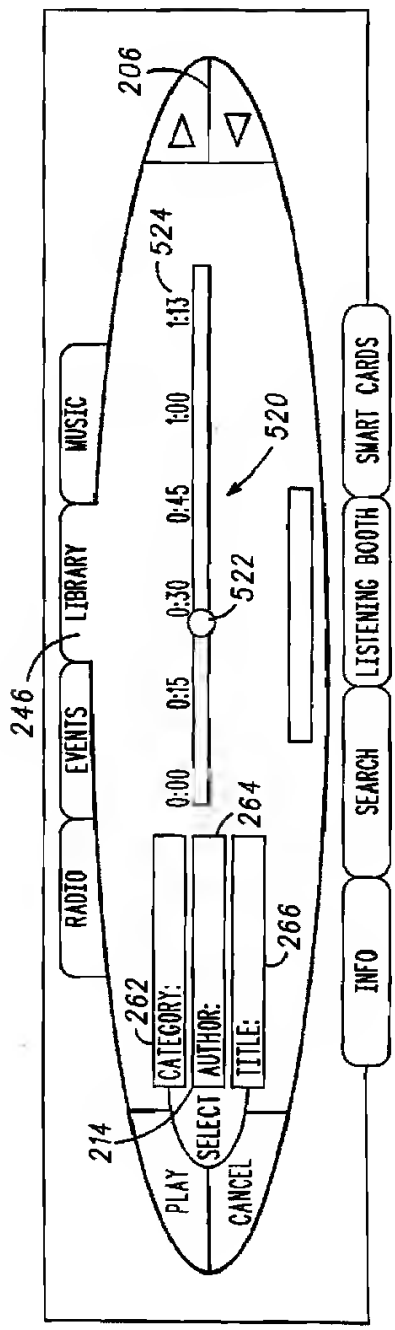

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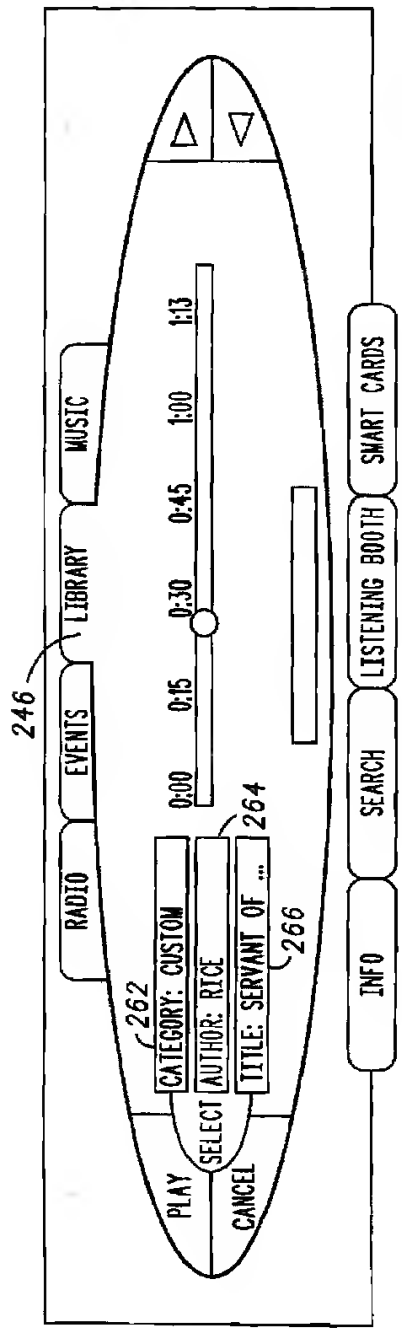

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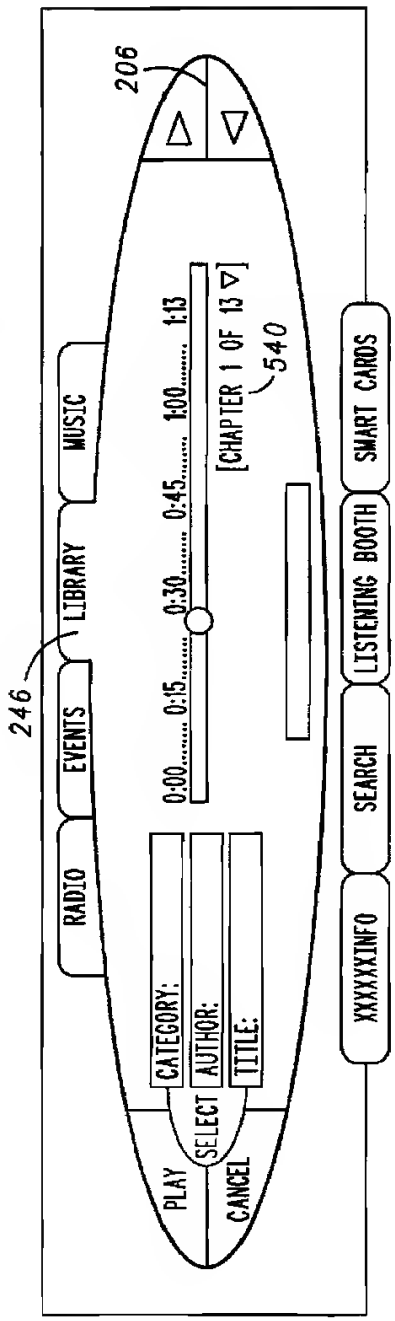

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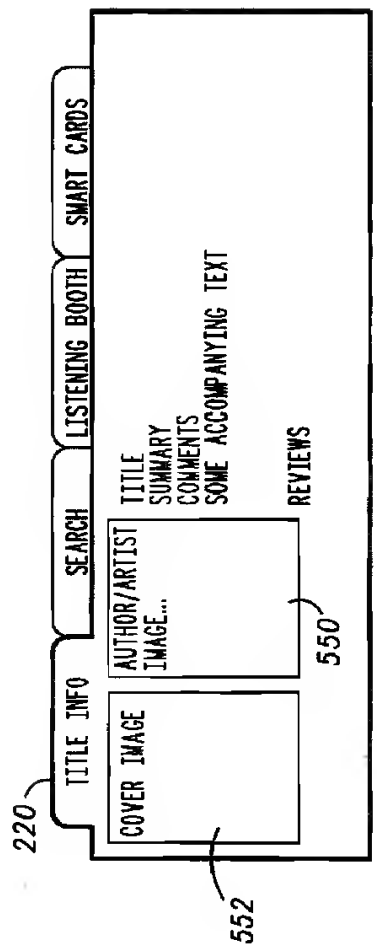

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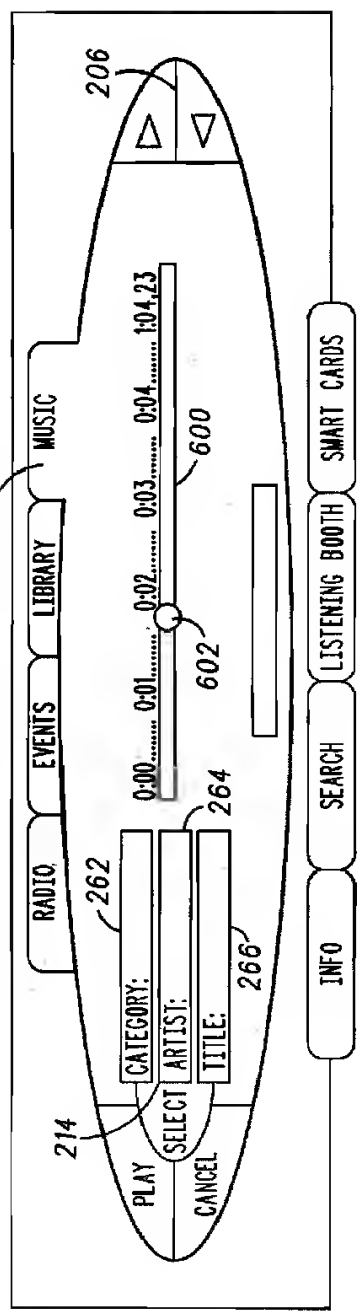

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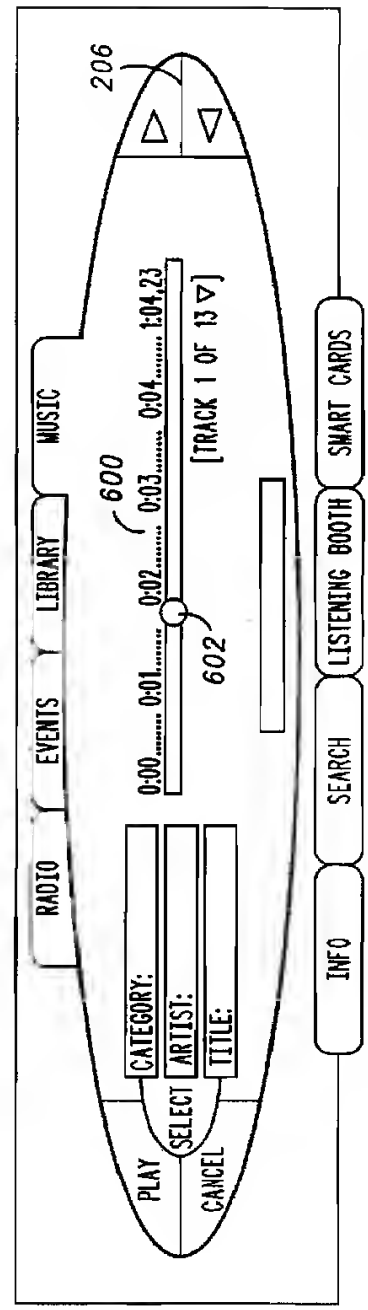

FIG. 21

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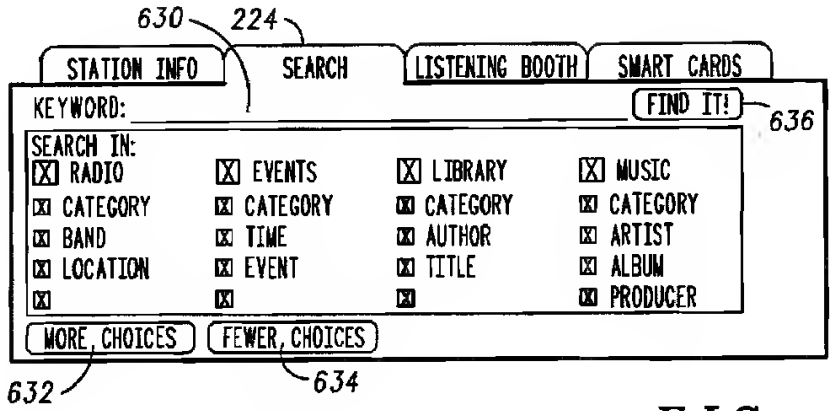

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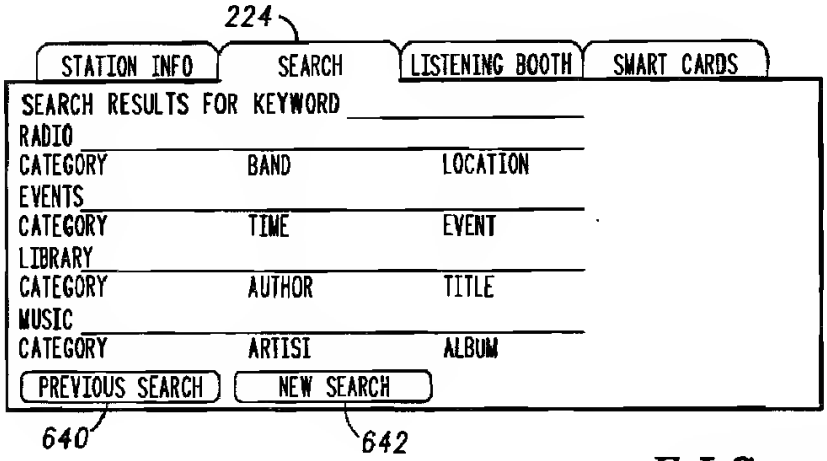

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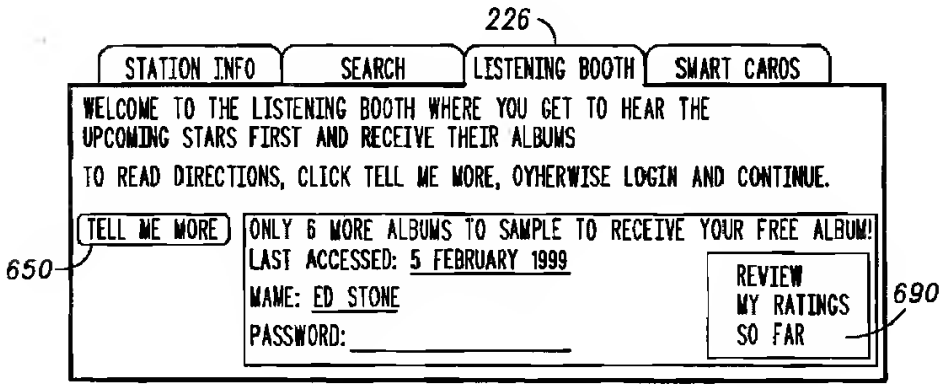

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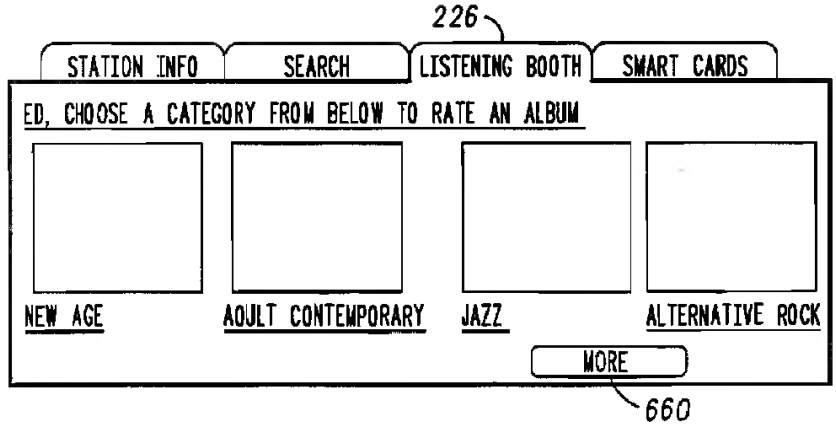

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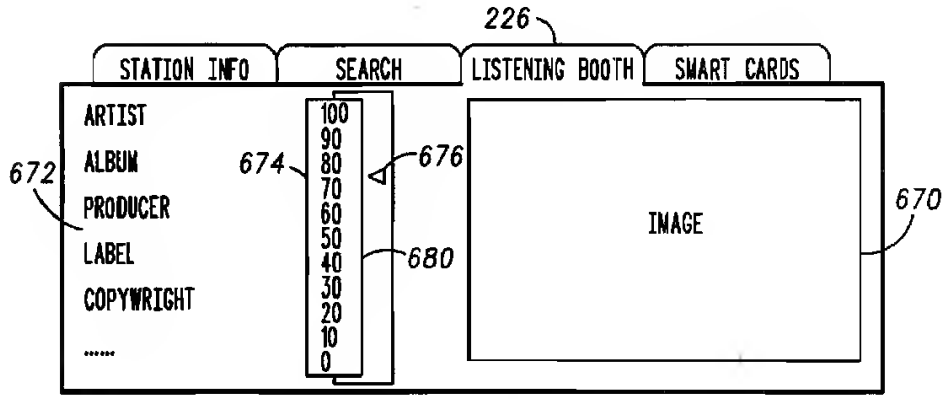

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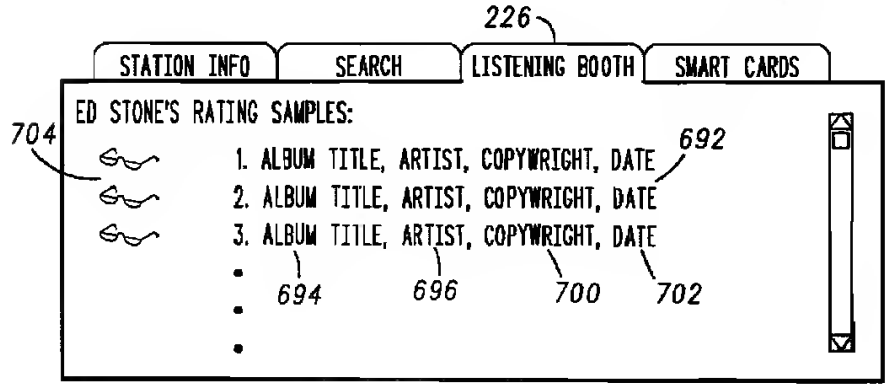

FIG. 27

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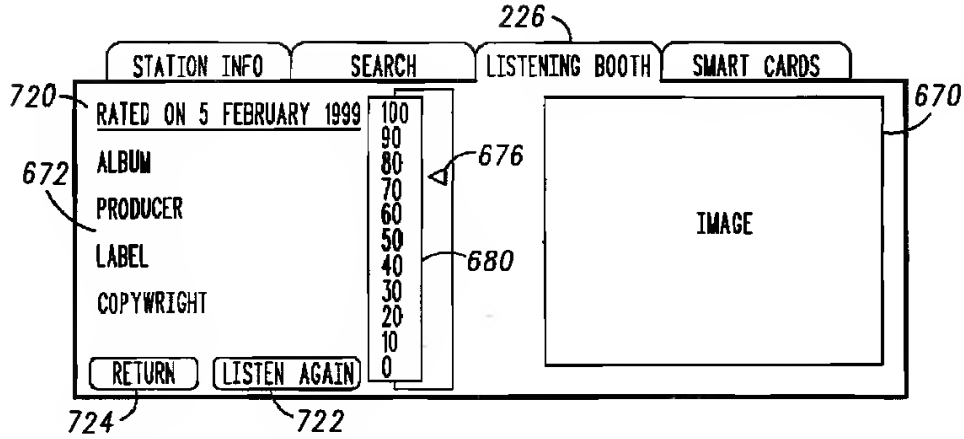

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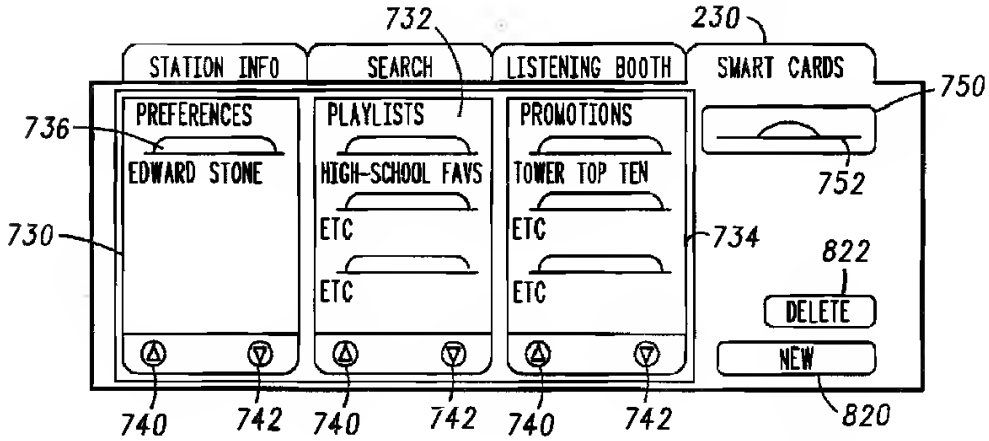

FIG. 29

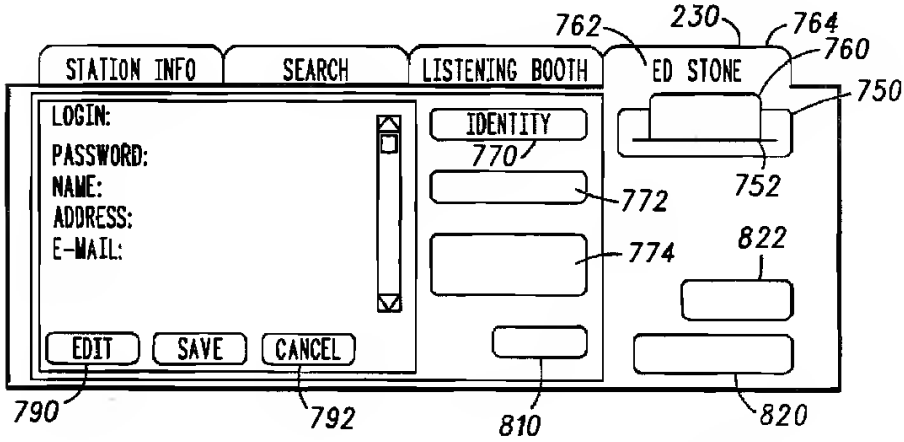

FIG. 30

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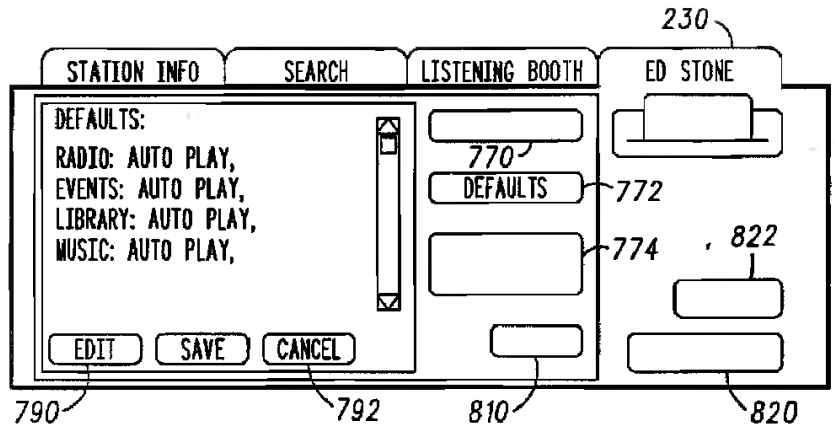
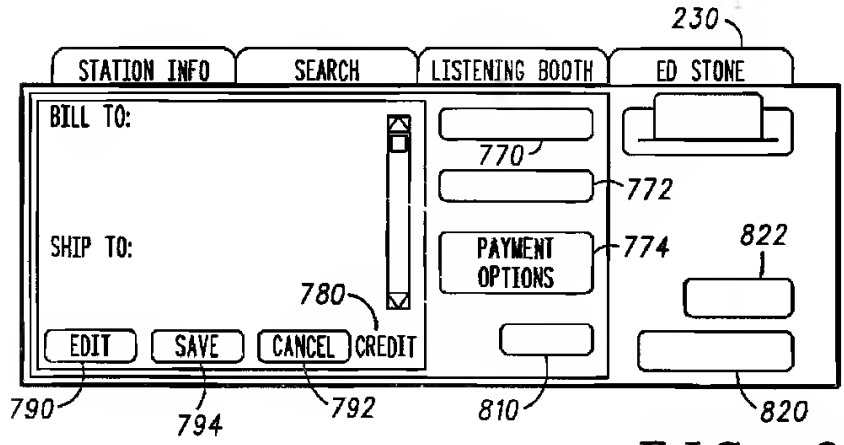


FIG. 31



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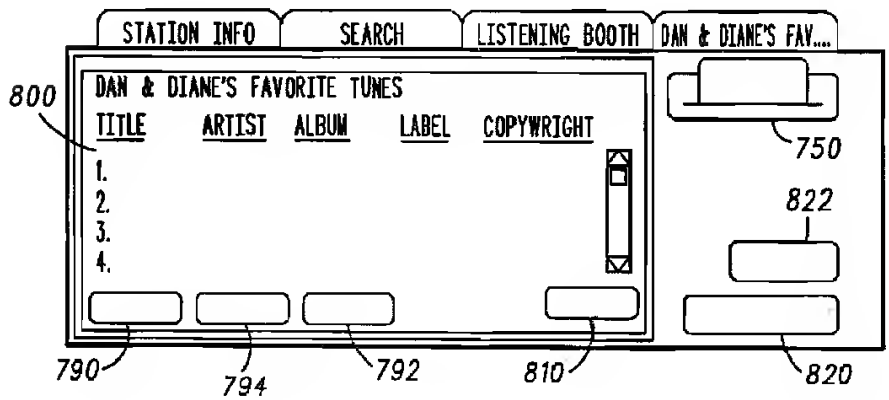

FIG. 33

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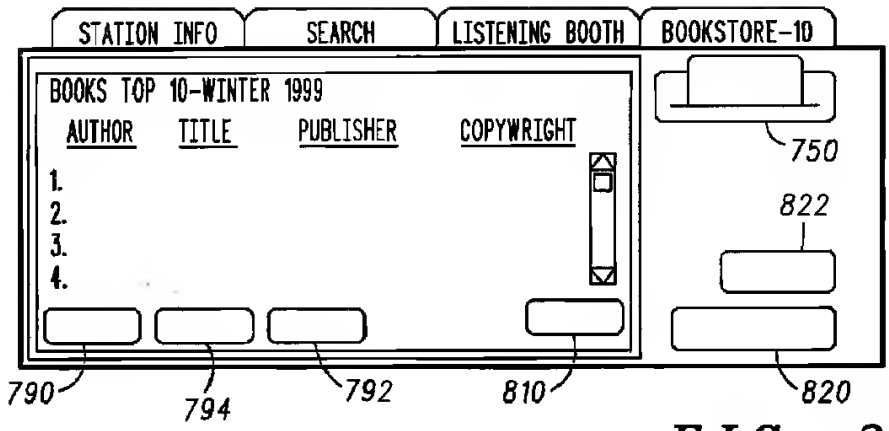

FIG. 34

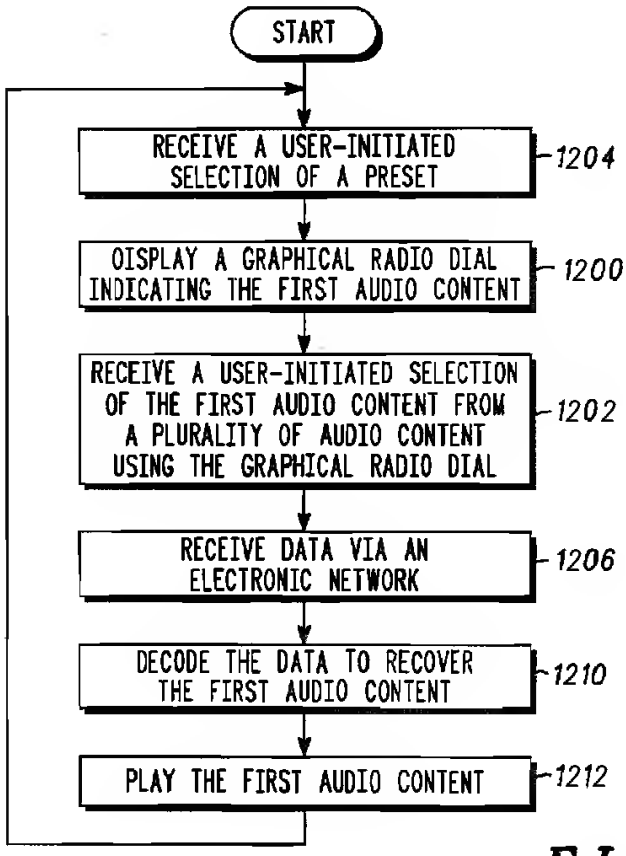

FIG. 44

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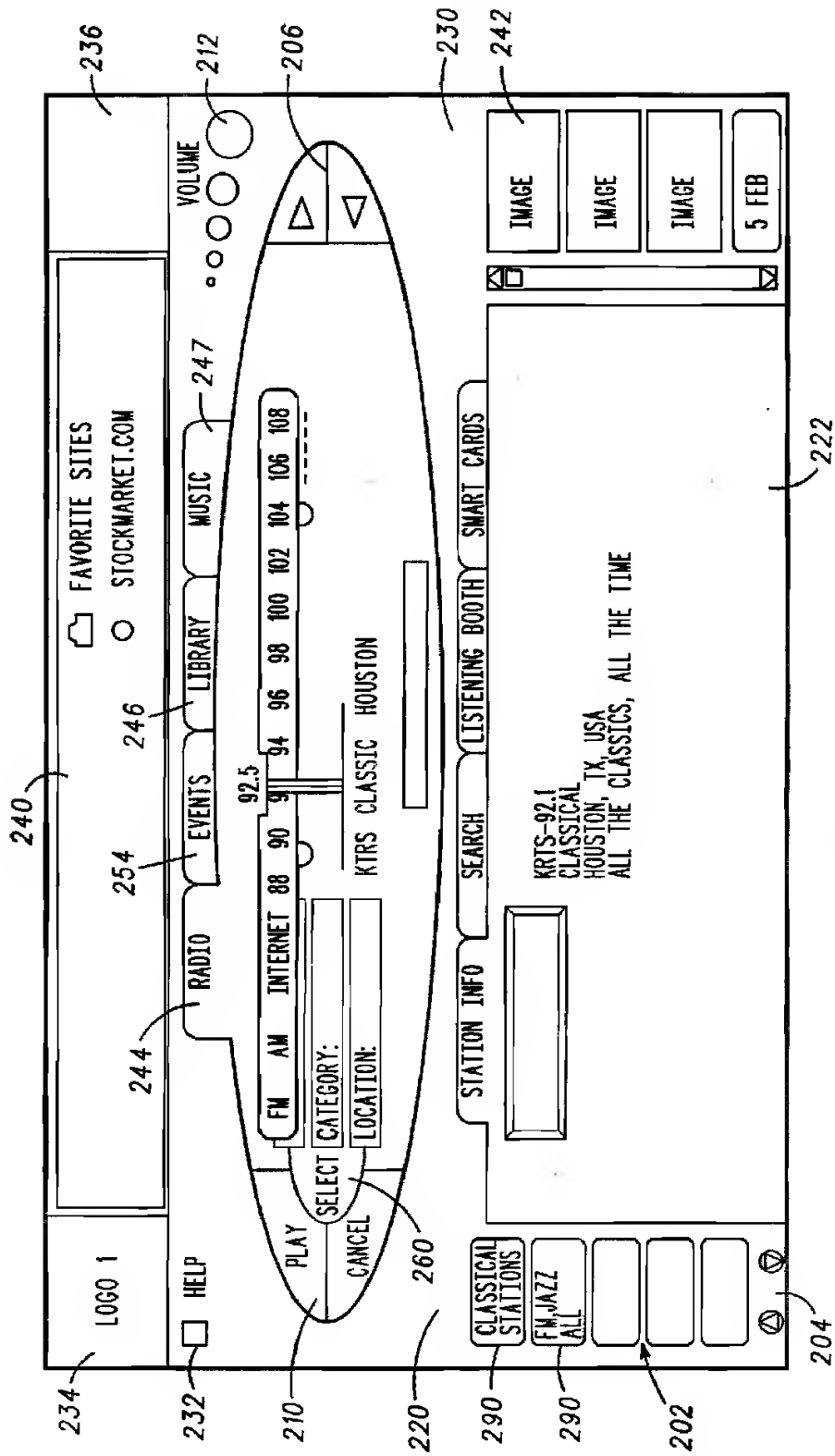

FIG. 35

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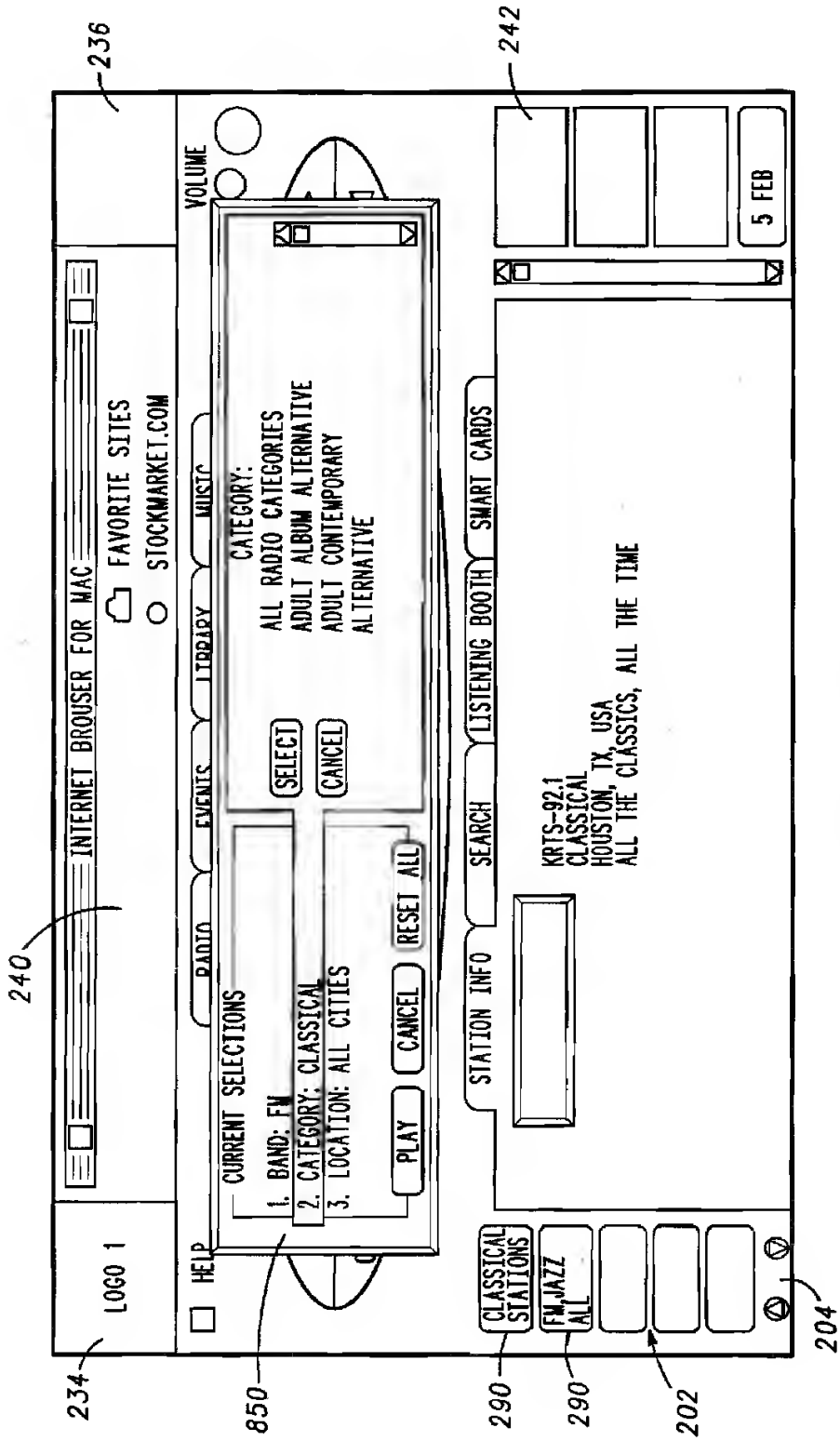

FIG. 36

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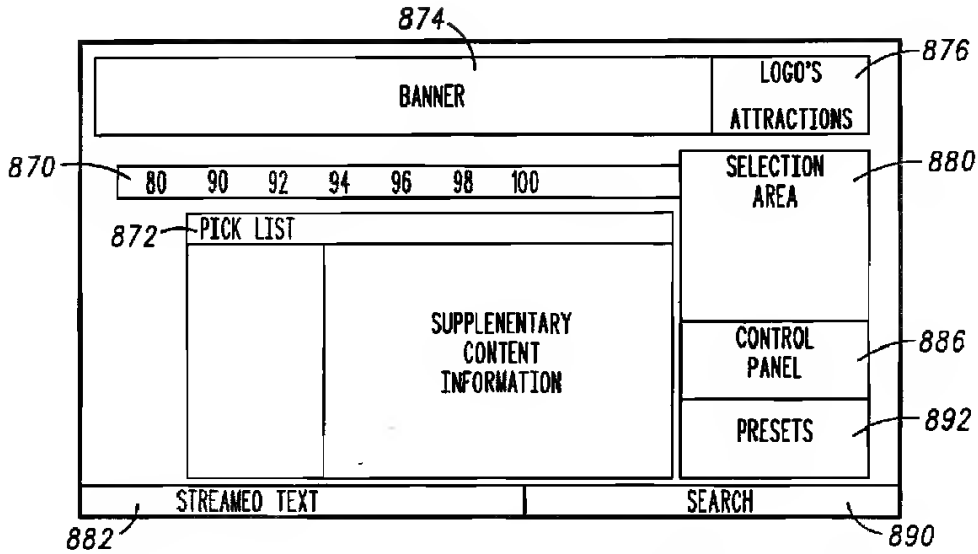

FIG. 37

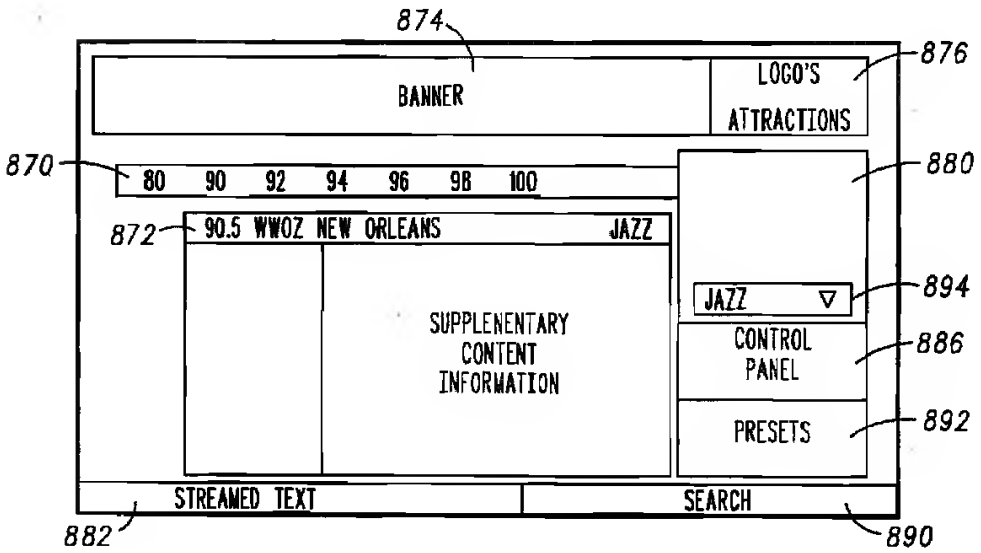

FIG. 38

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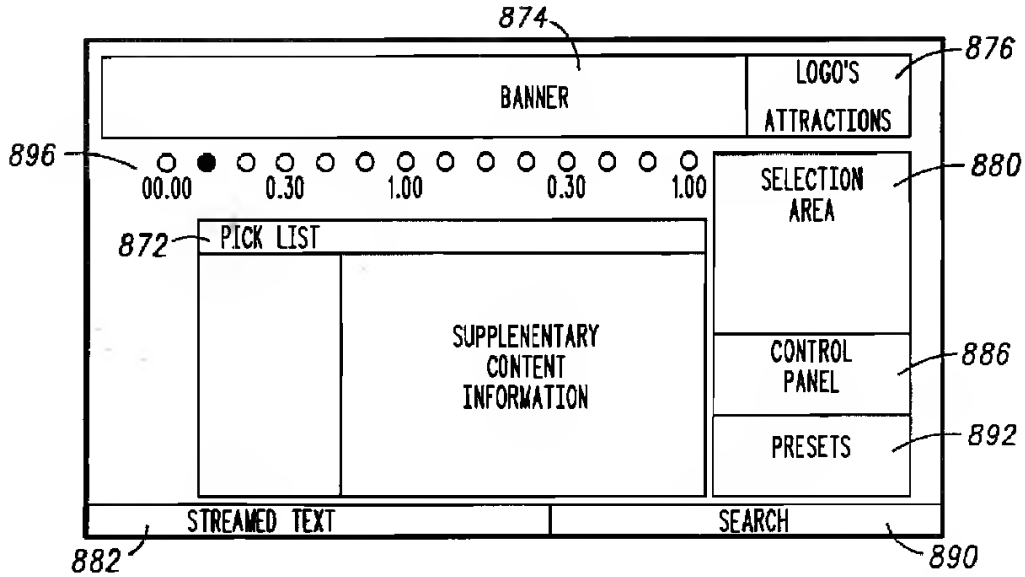

FIG. 39

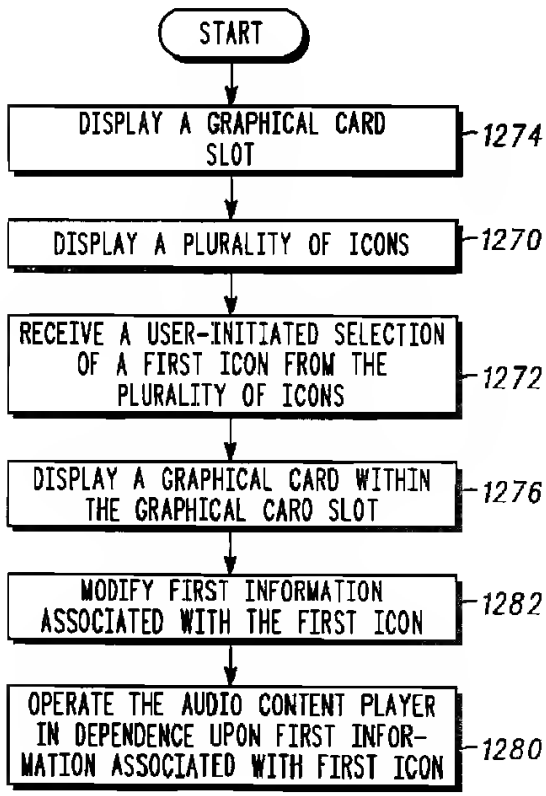

FIG. 46

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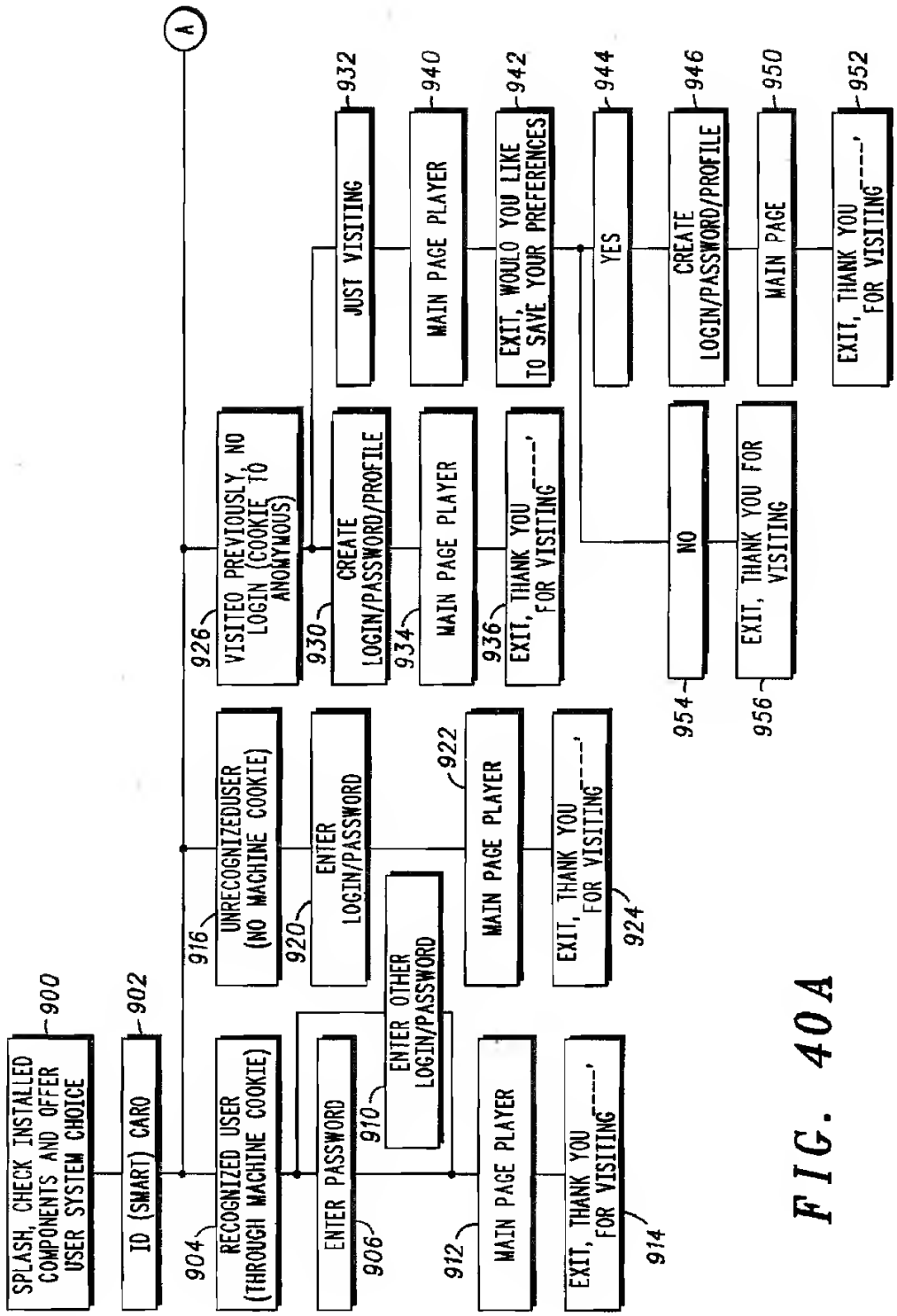

FIG. 40A

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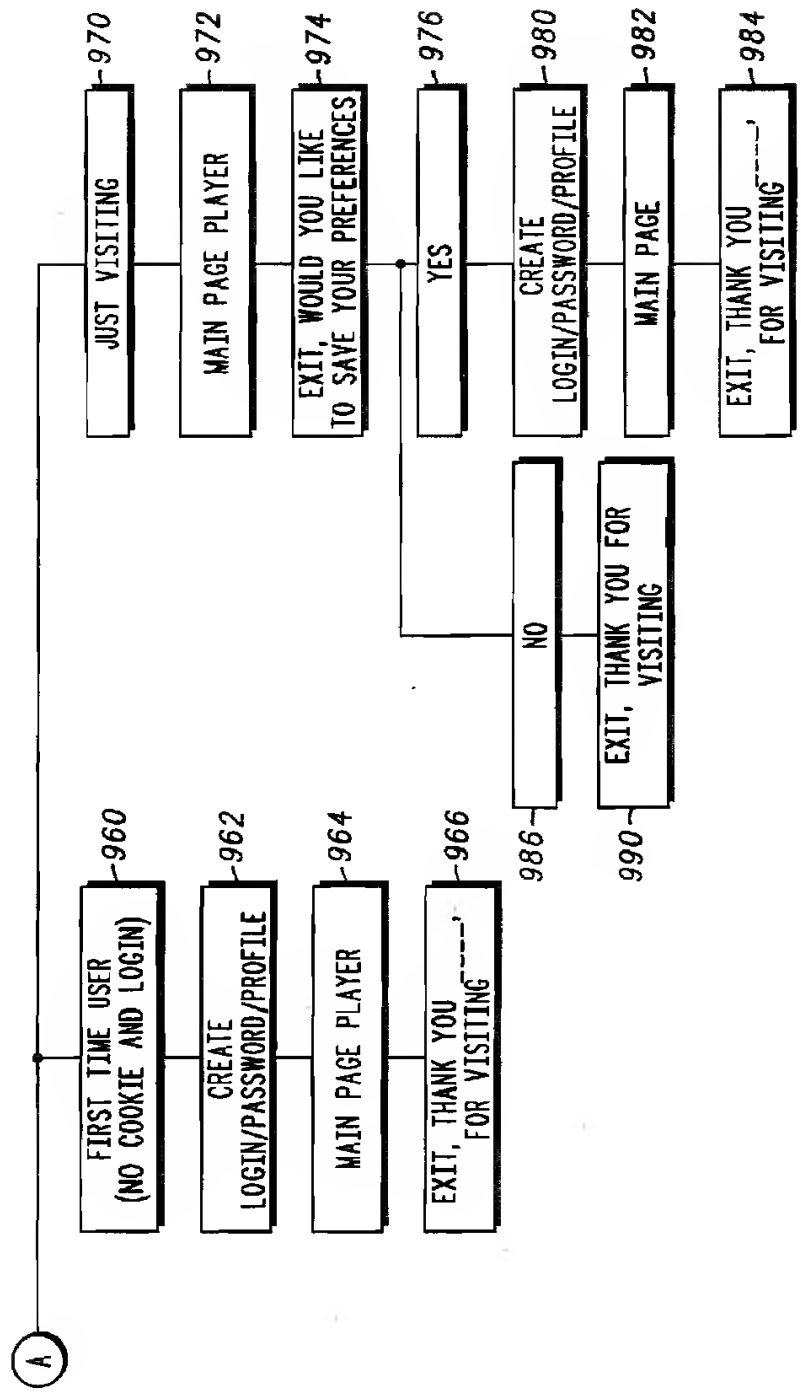

FIG. 40B

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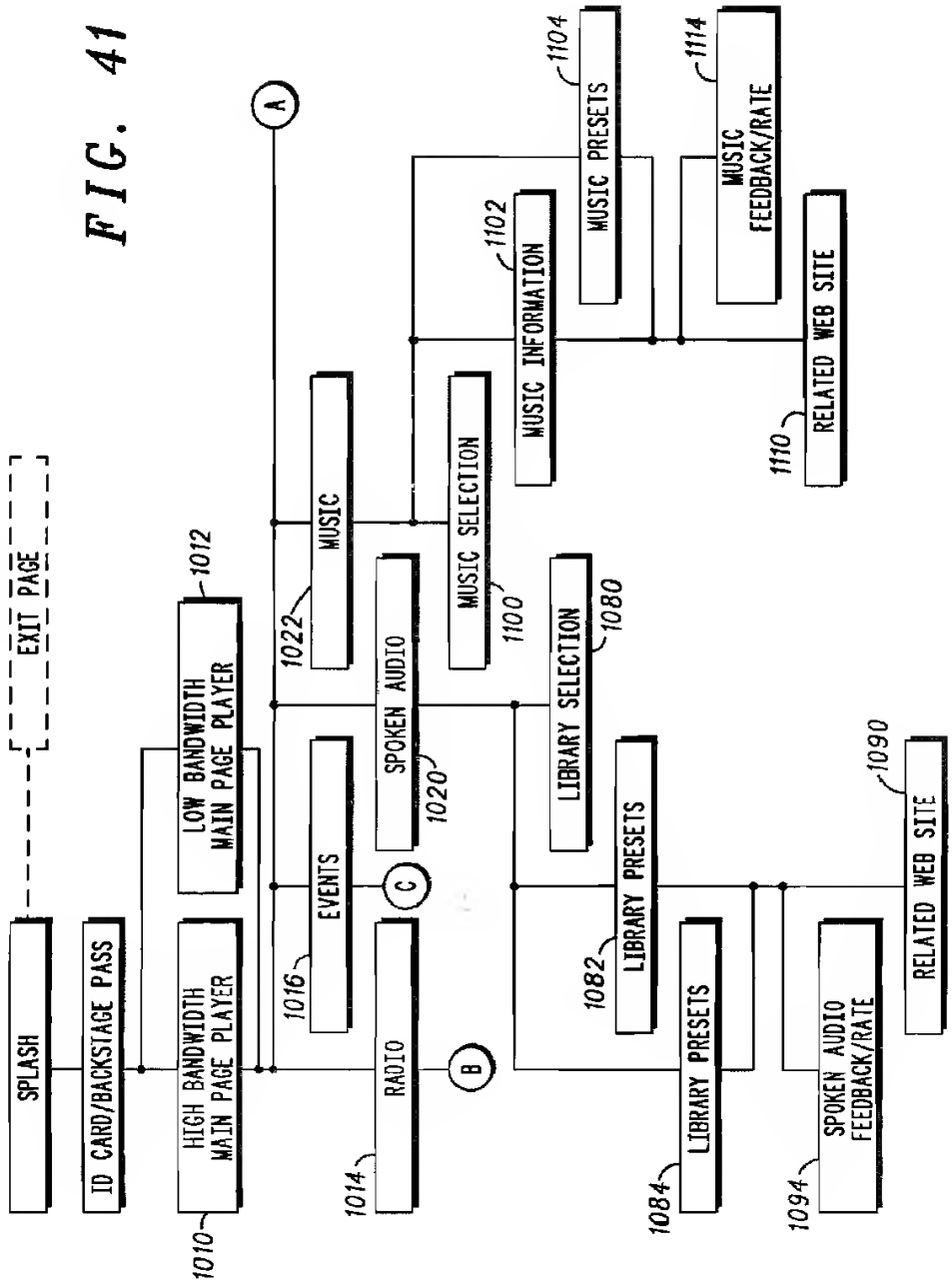
FIG. 41



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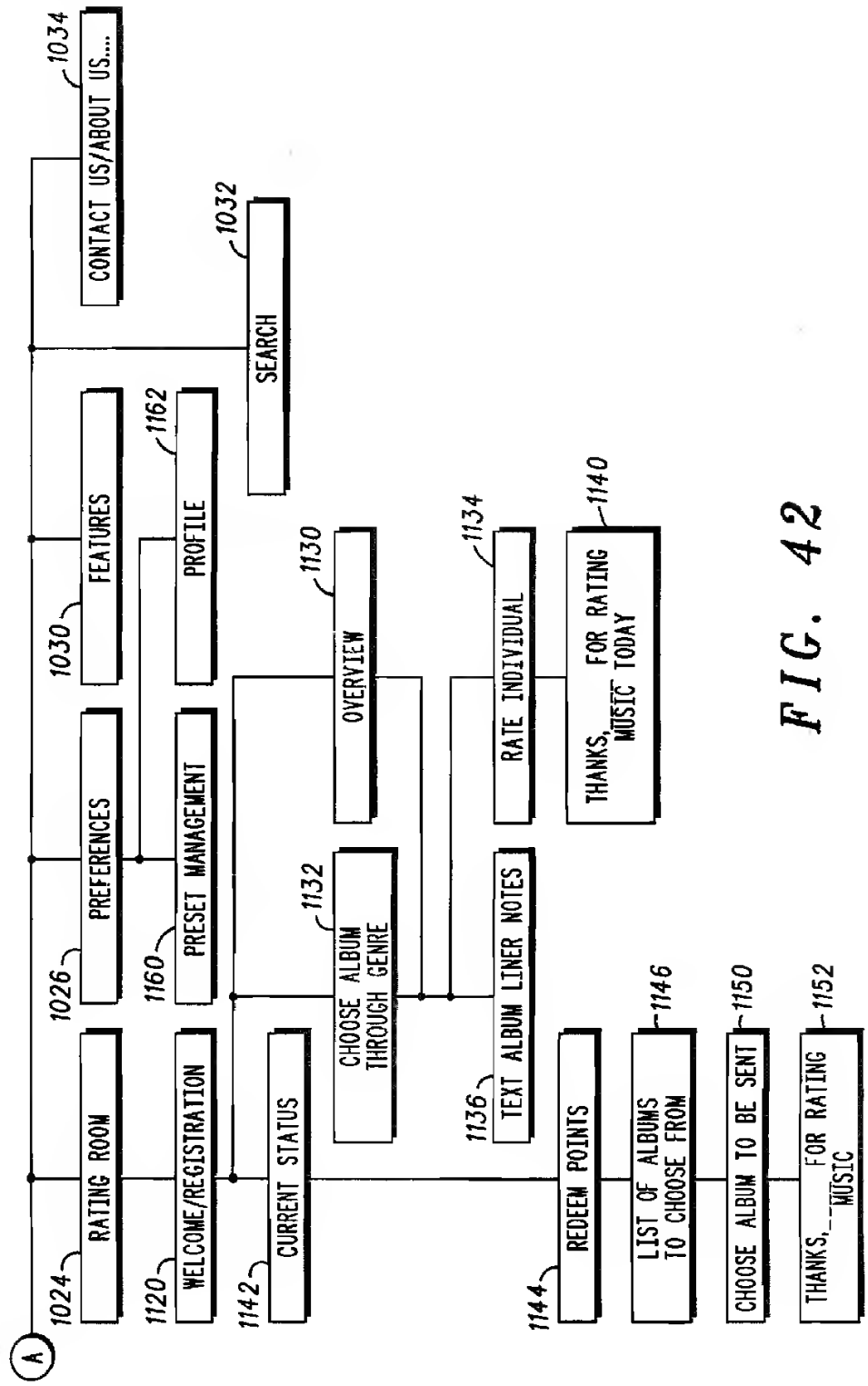

FIG. 42

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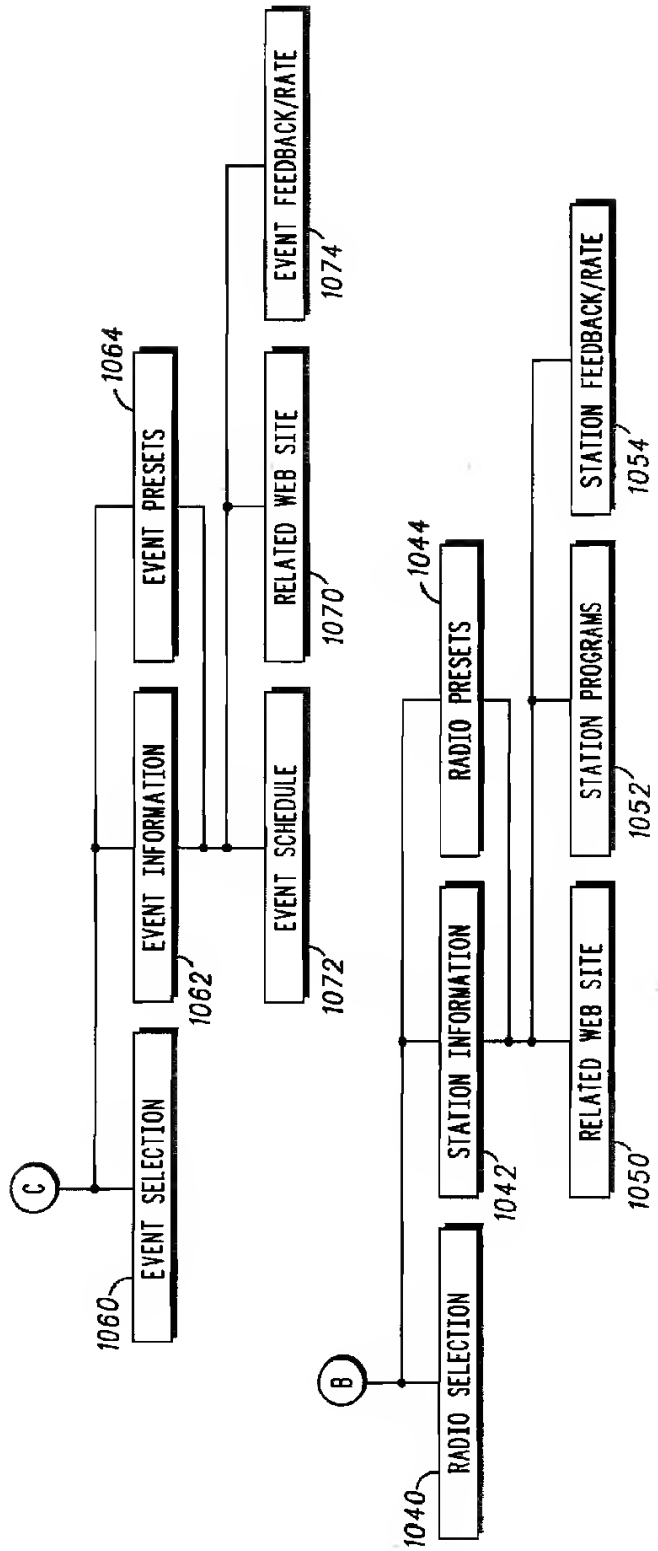

FIG. 43

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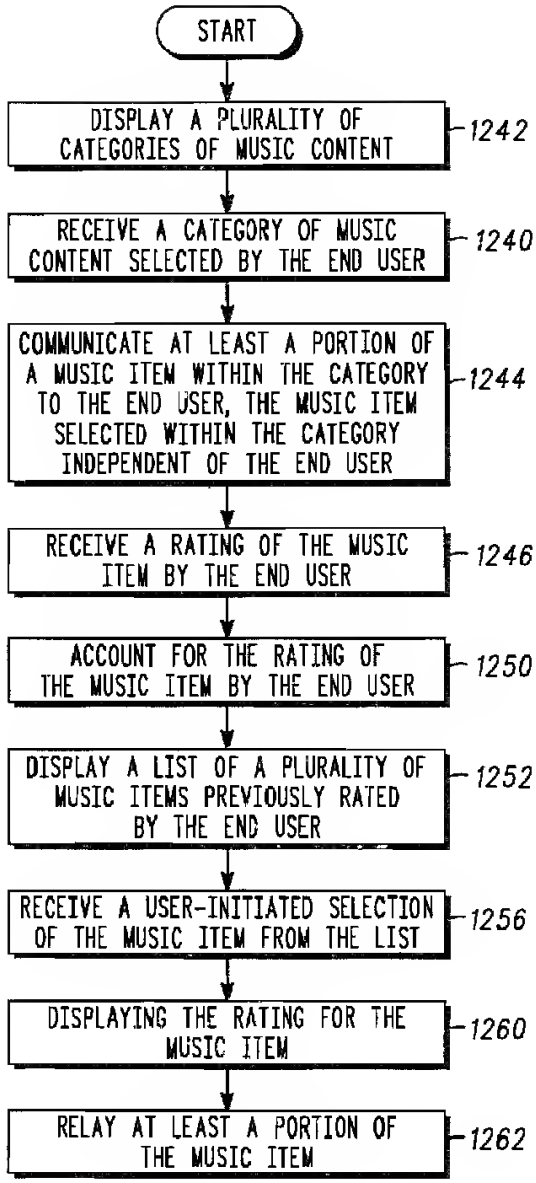

FIG. 45

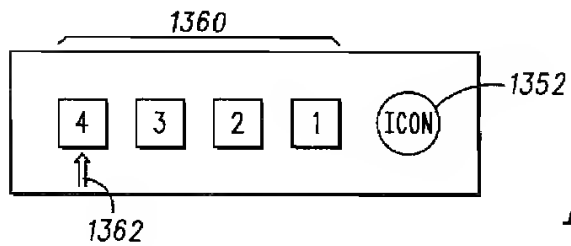

FIG. 51

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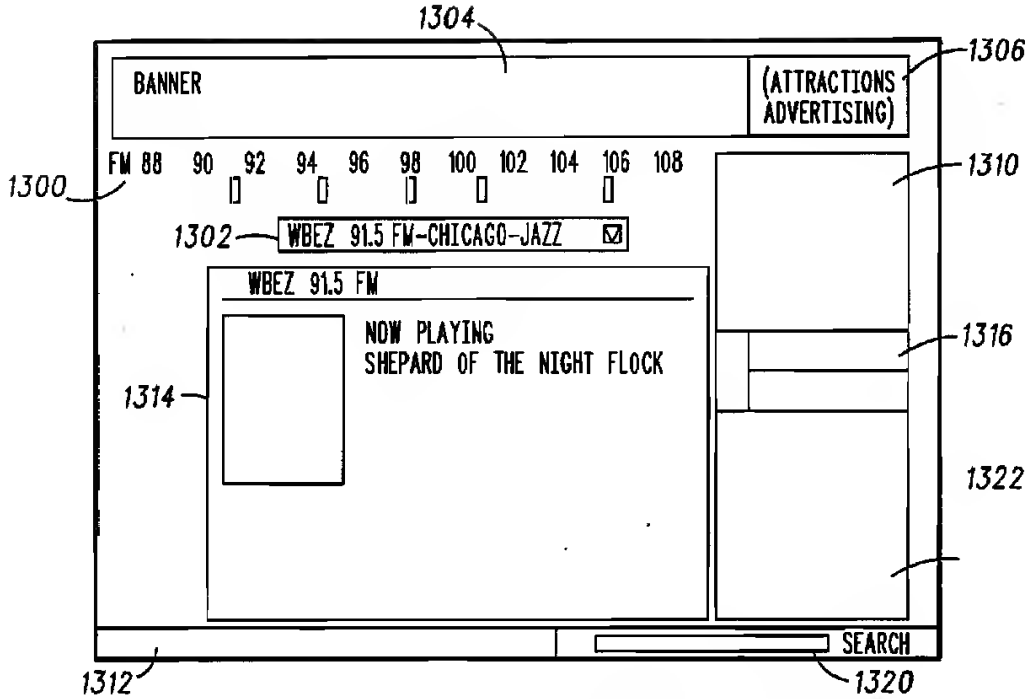

FIG. 47

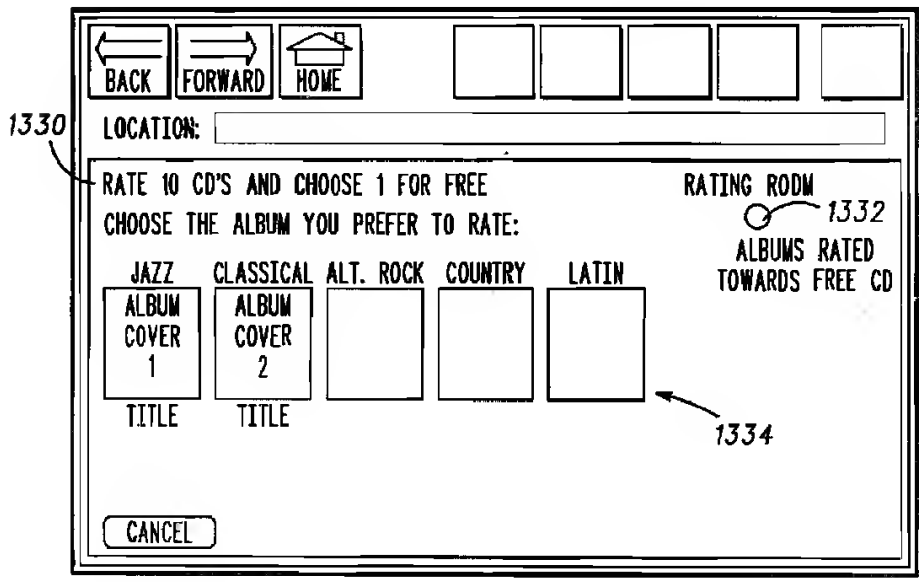

FIG. 48

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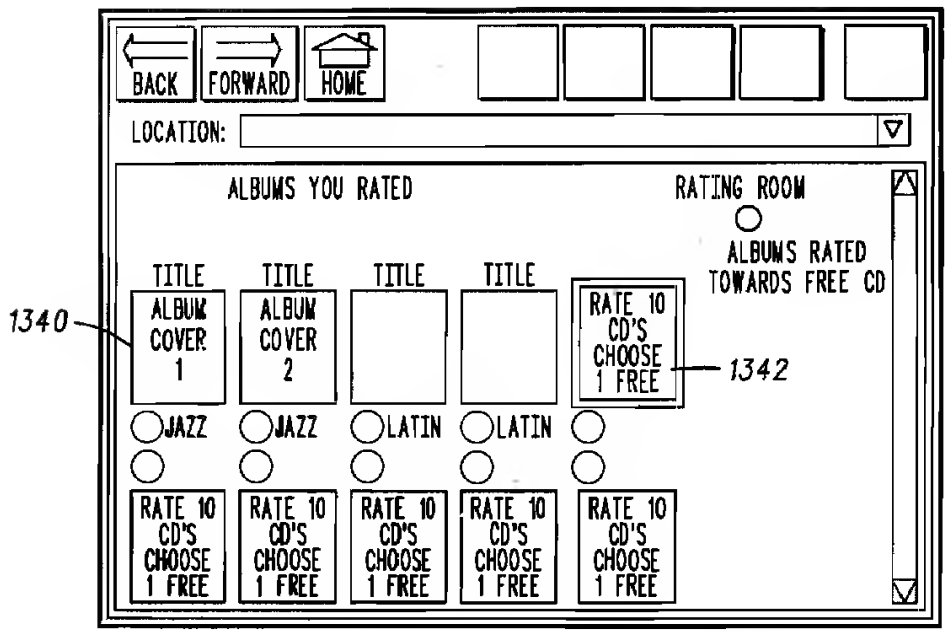

FIG. 49

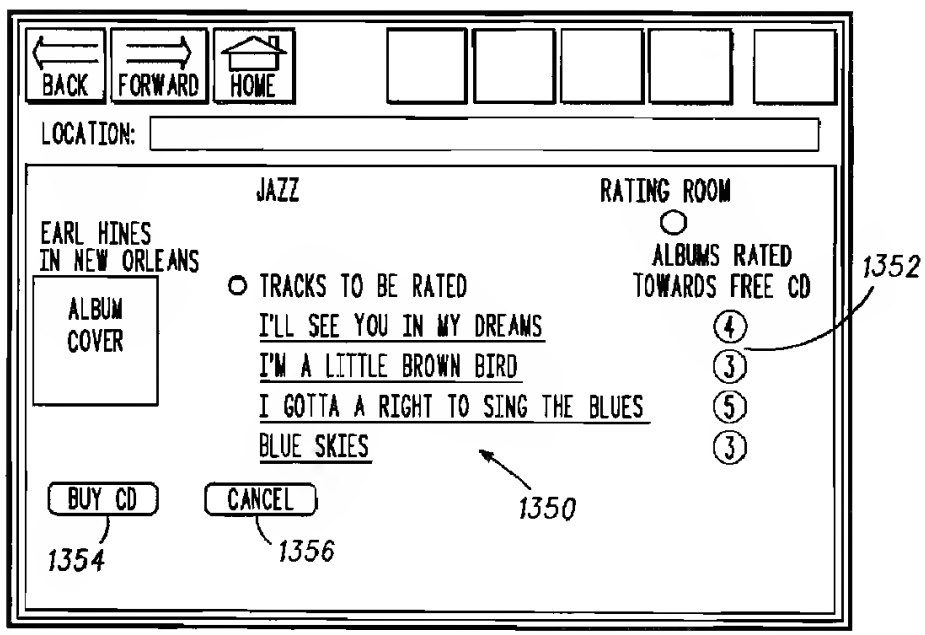

FIG. 50

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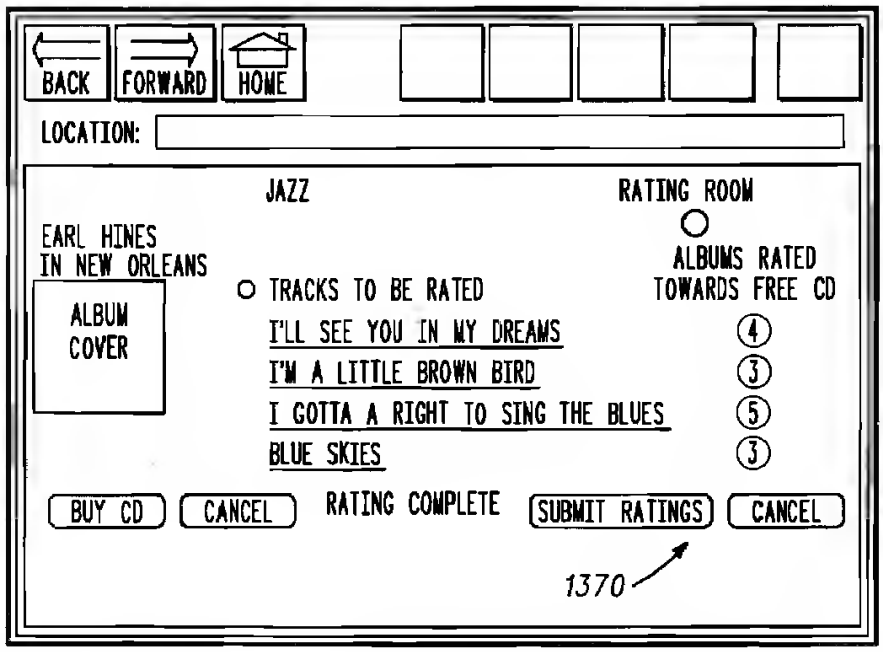

FIG. 52

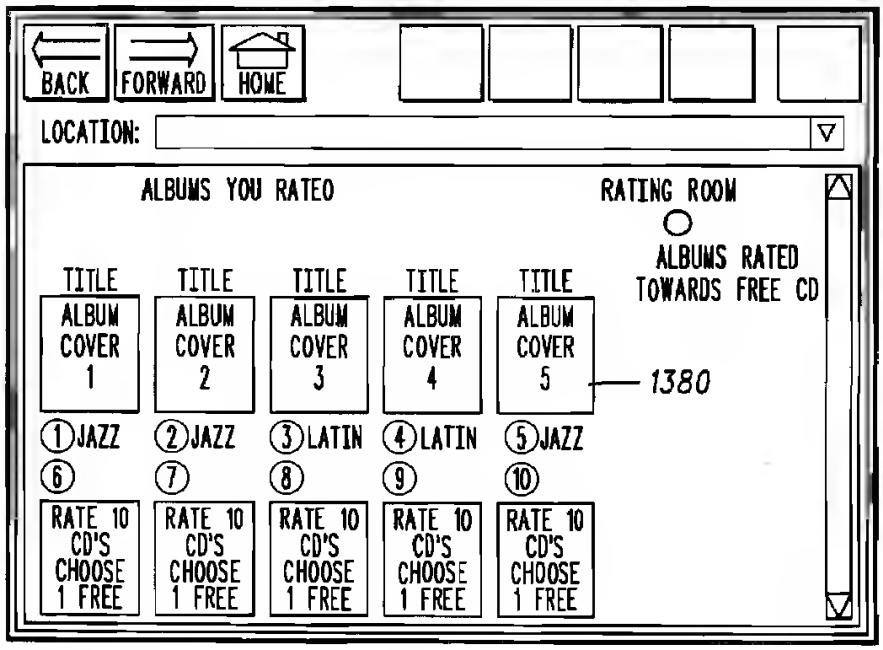

FIG. 53

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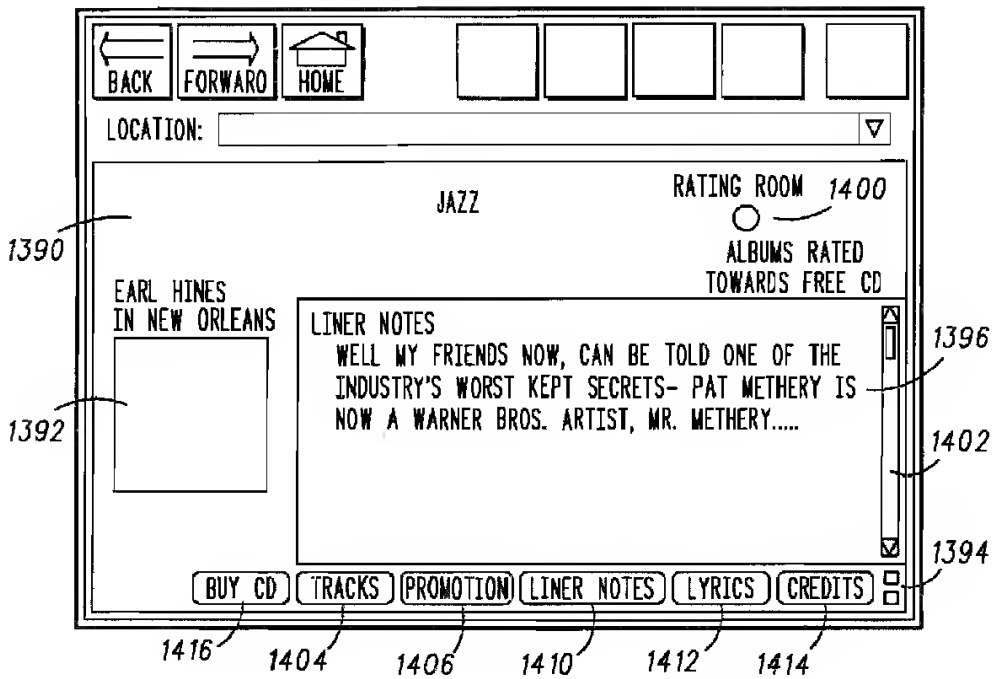

FIG. 54

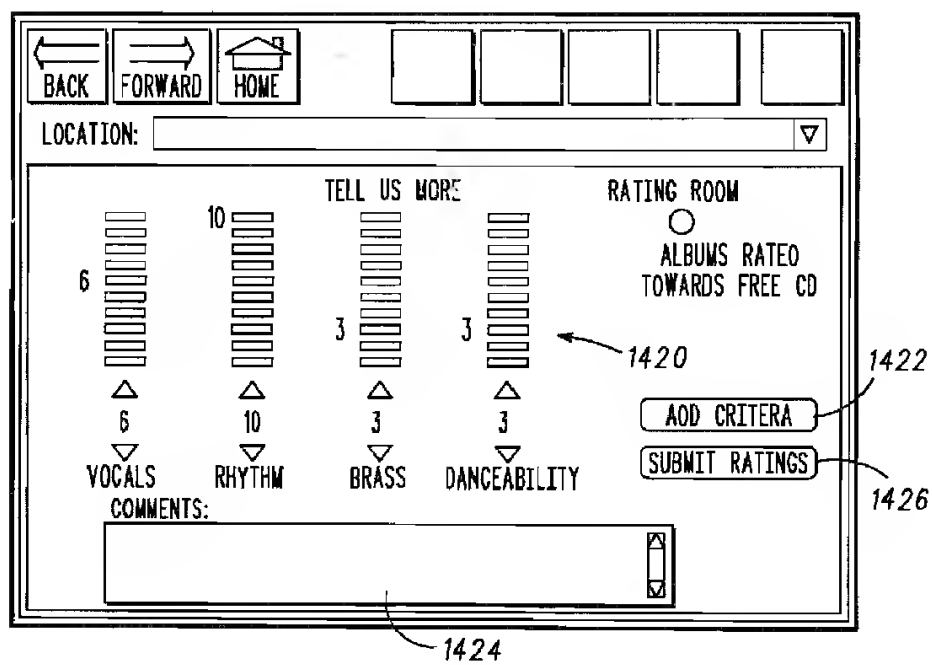

FIG. 55

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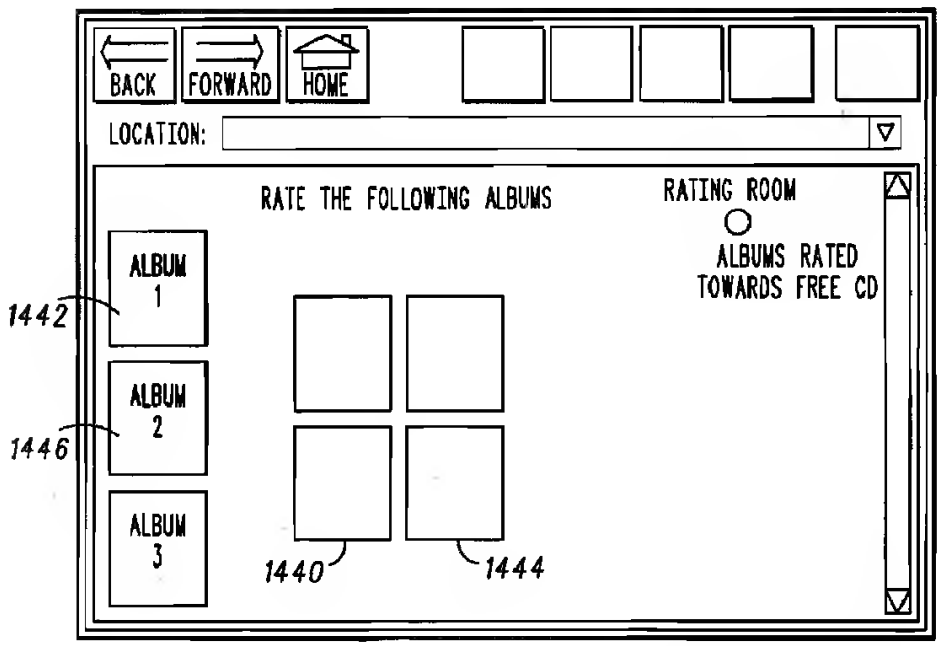

FIG. 56

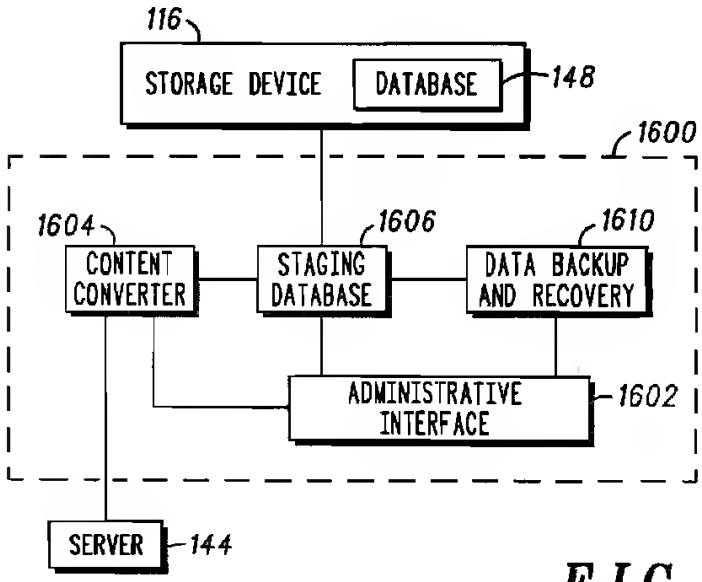

FIG. 58

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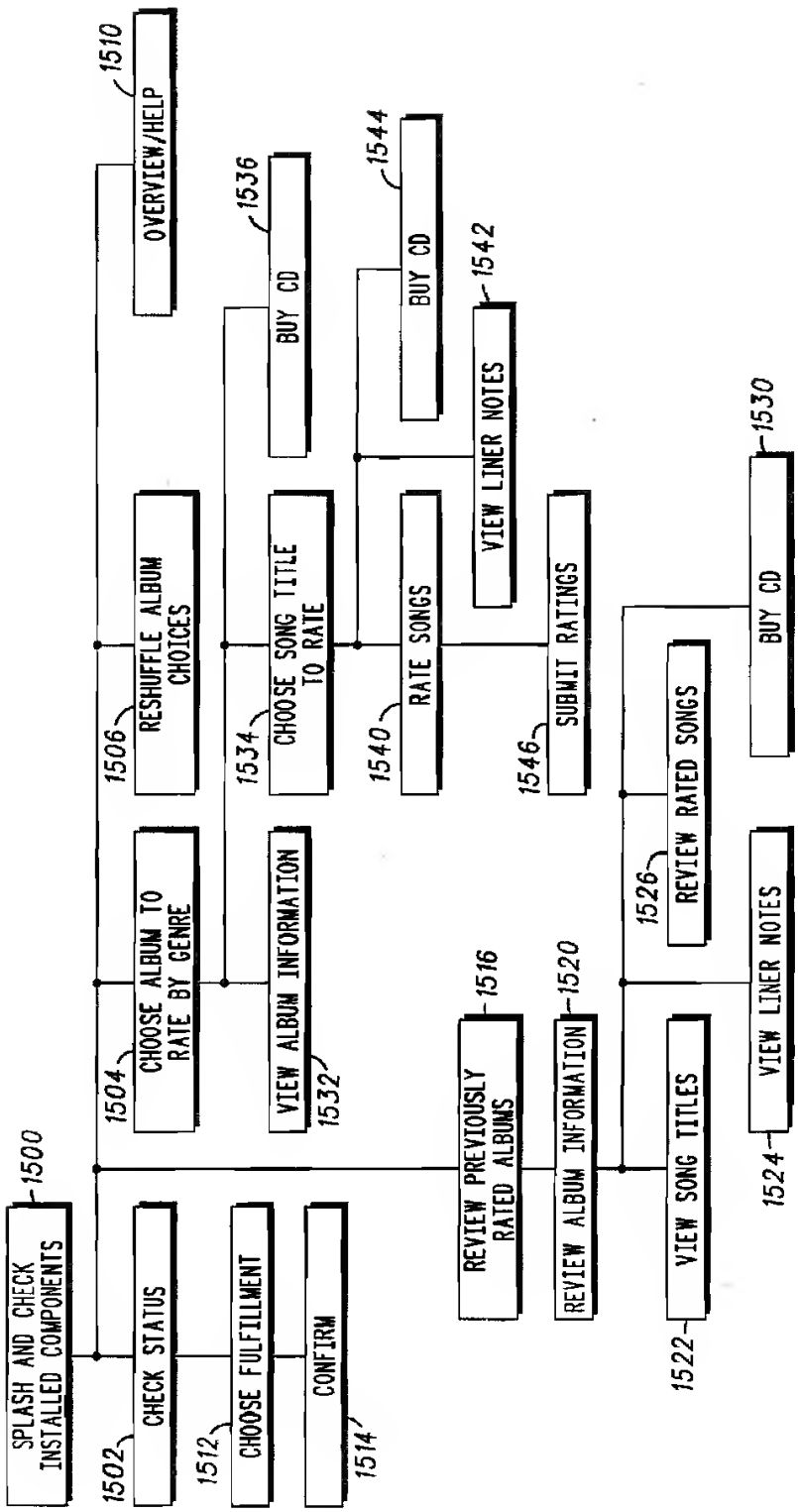

FIG. 57

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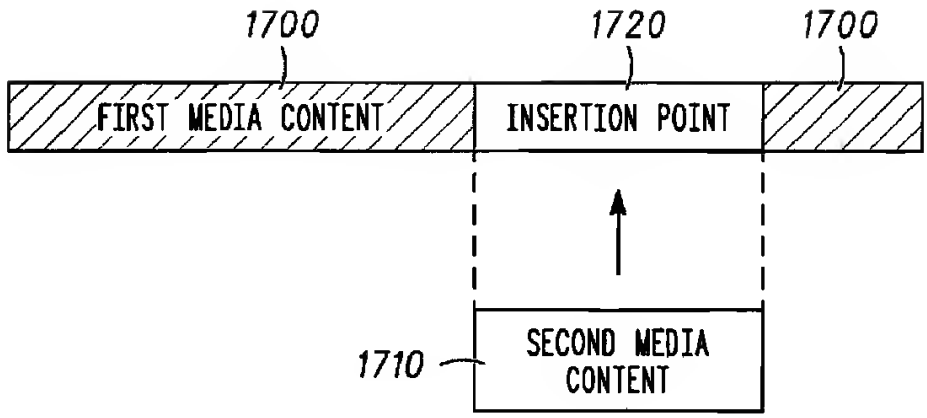

FIG. 59

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CONTENT PLAYER METHOD AND SERVER WITH USER PROFILE

RELATED APPLICATION(S)

This is a continuation-in-part of U.S. patent application Ser. No. 08/976,971 filed on Nov. 25, 1997, now abandoned.

TECHNICAL FIELD

The present invention relates to methods and systems for distributing and playing content such as audio content.

BACKGROUND OF THE INVENTION

An increasing number of audio content items are becoming accessible via the Internet. Many radio stations now simulcast their over-the-air broadcast via the Internet. Some television networks are also simulcasting their over-the-air or cable broadcasts via the Internet. In addition, archived items such as archived radio programs, speeches, and music are also available via the Internet.

An audio content item is communicated to an end user's computer using either streamed data or a data file. The end user's computer decodes the streamed data or the data file using audio player software. Examples of audio player software include RealPlayer from Real Networks and Netscape Media Player from Netscape. The audio player software directs the computer to play back the audio content item.

Services such as AudioNet (whose Internet domain name is registered to AudioNet, Inc. of Santa Clara, Calif., U.S.A., and administered by Yahoo! Inc. of Sunnyvale, Calif., U.S.A.) and Timecast (whose Internet domain name is registered to Progressive Networks, Inc. of Seattle, Wash., U.S.A.) provide directories for audio content items available via the Internet. Using these services, the end user can select an audio content item for playback using his/her computer. However, interaction between the audio player software and the service may be limited to that necessary to play back the audio content item.

User feedback to movies and music is also currently of interest. Movie Critic (whose Internet domain name is registered to Songline Studios, Macromedia, Inc., of San Francisco, Calif., U.S.A.) recommends movies of potential interest to an end user in return for the end user's rating of a movie he/she has seen. Billboard magazine and its associated Web site provide music rankings based on sales and air play.

Broadcast Architecture provides a service for testing audio playlists. A methodology employed by Broadcast Architecture comprises physically assembling one or more listeners to test a playlist, playing one or more songs to the listeners, and receiving rating signals from the listeners. The rating signals are generated by listeners turning up or down a dial depending on whether they like or dislike a song. The rating signals can be plotted in a time series to interpret the results.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is pointed out with particularity in the appended claims. However, other features of the invention are described in the following detailed description in conjunction with the accompanying drawings in which:

FIG. **1** is a block diagram of an embodiment of a system for providing audio content via an electronic network;

FIG. **2** is a first display window in an embodiment of a graphical user interface;

FIG. **3** is a display of a portion of the graphical user interface including selection attribute indicators;

FIG. **4** is an illustration of an embodiment of a streaming indicator;

FIG. **5** is an illustration of an embodiment of volume controls;

FIG. **6** is an illustration of an example of a portion of a display window upon receiving a user-initiated selection of a radio category control;

FIG. **7** is an illustration of an example of a graphical radio dial for selecting Internet or other electronic network broadcasts;

FIG. **8** is an example illustration of using a location attribute field;

FIG. **9** is an example of a second display region providing auxiliary information about a particular station.

FIG. **10** is an example of a programming guide in a second display region,

FIG. **11** is an illustration of an example of a portion of the interface displayed upon receiving a user-initiated selection of an events category control;

FIG. **12** is an example illustration of using a time attribute field;

FIG. **13** is an example illustration of using an event attribute field,

FIG. **14** is an illustration of an example of a notification prompt;

FIG. **15** illustrates an example of the second display region displaying auxiliary information about an event;

FIG. **16** is an illustration of an example of a portion of the interface displayed upon receiving a user-initiated selection of the library category control;

FIG. **17** shows an example of text in the fields associated with an approach to navigating to library material;

FIG. **18** shows an indicator of which chapter is current and the number of chapters that exist;

FIG. **19** illustrates an example of the second display region being used to provide auxiliary information about a title,

FIG. **20** is an illustration of an example of a portion of the interface displayed upon receiving a user initiated selection of a music category control;

FIG. **21** shows an indicator of which track is current and the number of tracks that exist,

FIG. **22** illustrates an example of a search feature provided in the second display region;

FIG. **23** illustrates an example of search results displayed in the second display region,

FIG. **24** illustrates an example of a listening booth feature provided in the second display region;

FIG. **25** is an example of a second display for the listening booth feature;

FIG. **26** is an example of a third display for the listening booth feature;

FIG. **27** is an example display provided upon selecting the control;

FIG. **28** depicts an example of a portion of the interface displayed upon selecting an icon,

FIG. **29** illustrates an example of a card organizer display for a smart card feature;

FIG. **30** is an example portion of the interface displayed in response to a drag-and-drop operation;

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FIG. 31 shows a display of a defaults area initiated upon selecting a second graphical button;

FIG. 32 shows a display of a payment options area initiated upon selecting a third graphical button;

FIG. 33 is an example portion of the interface displayed in response to a drag-and-drop operation of a playlist smart card to the fourth portion;

FIG. 34 is an example portion of the interface displayed in response to a drag-and-drop operation of a promotions smart card to the fourth portion;

FIG. 35 is a screen shot of a first preferred embodiment of the graphical user interface in the radio content mode;

FIG. 36 is a screen shot showing a content selection interface in the first preferred embodiment;

FIG. 37 is a screen shot of a second preferred embodiment of the graphical user interface;

FIG. 38 is a screen shot of the second preferred embodiment in a radio player mode;

FIG. 39 is a screen shot of the second preferred embodiment in an events player mode;

FIGS. 40A and 40B are flow charts of an embodiment of a method of providing the graphical user interface;

FIGS. 41 to 43 are block diagrams summarizing a site map for an embodiment of the graphical user interface;

FIG. 44 is a flow chart summarizing steps performed in an embodiment of a method of playing first audio content using a computer;

FIG. 45 is a flow chart summarizing steps in an embodiment of a method of obtaining user feedback to music content;

FIG. 46 is a flow chart summarizing steps in an embodiment of a method of assisting operation of an audio content player;

FIG. 47 is a screen shot of a third embodiment of the graphical user interface;

FIG. 48 is an example of a first display in a preferred embodiment of a listening booth or rating room feature;

FIG. 49 is an example of a second display for reviewing rated items in an embodiment of a listening booth or rating room feature;

FIG. 50 is an example of a third display for rating an item in a preferred embodiment of a listening booth or rating room feature;

FIG. 51 is a view of an embodiment of the graphical rating tool;

FIG. 52 is an example of a modified third display, in an embodiment of a listening booth or rating room feature, once all of the tracks for an item have been rated;

FIG. 53 is an example of the second display, in an embodiment of a listening booth or rating room feature, updated based upon a submission of ratings for the item;

FIG. 54 is an example of a fourth display in an embodiment of a listening booth or rating room feature;

FIG. 55 is an example of a fifth display in an embodiment of a listening booth or rating room feature;

FIG. 56 is an example of a sixth display in an embodiment of a listening booth or rating room feature;

FIG. 57 is a block diagram summarizing a site map for an embodiment of the listening booth or rating room feature; and

FIG. 58 is a block diagram of an embodiment of a content entry subsystem.

FIG. 59 is a block diagram representing an association between media contents of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. 1 is a block diagram of an embodiment of a system for providing audio content via an electronic network **100**. Preferably, the electronic network **100** includes the Internet, the World Wide Web, an intranet, an extranet, or an on-line service such as America Online or WebTV.

The system comprises a server **102** which communicates with a plurality of client apparatus **104** including a client apparatus **106** via the electronic network **100**. The server **102** includes a computer **110** having a processor **112**, a memory **114**, and a storage device **116**. The server **102** has a transceiver **120** such as a modem, a network adapter, or a wireless transceiver which interfaces with the electronic network **100**.

The client apparatus **106** can have a variety of forms, including but not limited to, a general purpose computer, a network computer, a network television, an Internet television, and a wireless device. Regardless of its form, the client apparatus **106** typically includes a processor **122** in communication with at least one input device **124**, a transceiver **126**, a memory **130**, at least one storage device **132**, a display device **134**, and an audible output device **136**. Optionally, the client apparatus **106** includes a smart card reader **140**.

The processor **122** can include a microprocessor, an application-specific integrated circuit, or another suitable integrated circuit. The memory **130** can include a read-only memory and/or a random access memory in communication with the processor **122**. The transceiver **126** can include a modem, a network adapter, or a wireless transceiver to communicate signals via the electronic network **100**. The at least one input device **124** can include a keyboard, a pointing device, and/or a touch screen for receiving user-initiated events, actions, and selections from an end user. The at least one storage device **132** can include a floppy disk drive, a PC card storage device, an optical drive, a Digital Video Disk (DVD) drive, a Compact Disk Read Only Memory (CD-ROM) drive, or a hard drive to store computer-readable data. The display device **134** can include a monitor such as a liquid crystal display or a cathode ray tube to display a graphical user interface. The audible output device **136** can include a sound card and/or one or more speakers to play audio content to the end user.

A content delivery component **141**, including a player **142**, resides on the server **102** to assist in selecting, retrieving, and playing the audio content. The player **142** includes a computer program or other form of software or firmware which directs the server **102** and the client apparatus **106** to provide a graphical user interface for selecting, retrieving, and playing back audio content. More particularly, the computer program is operative to process and respond to user-initiated events, actions, and selections made using the at least one input device **124**, to select, retrieve, and playback the audio content using the audio output device **136**. Preferably, the computer program includes one or more of Hyper Text Marking Language (HTML) code, an applet (e.g. a JAVA applet), and animation plug-in code (e.g. Shockwave code) to provide the graphical user interface. The player **142** is accessible via the electronic network **100** by a dedicated electronic address such as a URL (Uniform Resource Locator).

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The player **142** accesses audio content either locally from the server **102** or remotely from a server **144**, and communicates the audio content to the client apparatus **106** using streaming technology. The server **144** can include, for example, a server from which AudioNet content is accessible.

The player **142** is operable in two modes: a browse mode and a search mode. The search mode provides a user-invoked function for performing a key-word, text-based search for content. The browse mode supports a categorical search for content using a visual interface. The content is categorized into a plurality of categories of content to assist in browsing for content. Preferably, the categories include a radio category, an events category, a library category, and a music category.

The player **142** is responsive to either a smart card **146** or a virtual smart card stored at one or more of the client apparatus **106** and the server **102**. The actual or virtual smart card can be used to separate access to content from the content itself. Further, the actual or physical smart card can act as a preference key to uniquely personalize a player for an individual in a consistent manner across all entry points or platforms. For a virtual smart card in this case, the client side provides a key to the server side of the preferences.

Optionally, the player **142** can provide a second visual interface having a smaller window that appears in the background. The smaller window provides a subset of the controls of the full graphical user interface. The subset of controls can include controls for selecting between programmed presets. For example, the smaller window can illustrate the presets.

The player **142** can cooperate with a browser program and/or a streaming audio plug-in program executed by the client apparatus **106**. Examples of the browser program include, but are not limited to, Netscape Navigator and Microsoft Internet Explorer. Examples of the streaming audio plug-in program include, but are not limited to RealAudio and RealPlayer from Real Networks, VxTreme and Netshow from Microsoft Corporation, VDOnet from VDO, TrueStream from Motorola, LiquidAudio, and other active streaming formats. Alternatively, the player **142** can include a stand-alone, application-based software program that is executed by the client apparatus **106**. In this case, it is preferred that the software program be operable without requiring interaction with a browser program. The software program cooperates with a network access routine executed by the client apparatus **106**.

It is noted that in general, the system can include a plurality of servers such as the server **102**. Each of the servers is identified by a corresponding site identification code. Each of the servers can include a database **148** for managing and monitoring the operation of the system. In this case, each database **148** can include a set of global parameters stored in its storage device **116**. One global parameter includes a listening time threshold parameter. If an end user listens to an audio item for a duration that attains or exceeds the listening time threshold, a listenership entry is recorded in the database **148**, otherwise, no entry is recorded. Other global parameters include user permission parameters, and parameters for system level performance reports.

In general, some parameters are maintained for all of the databases. These parameters include those necessary to the operation and the performance of the system. Here, a parameter generated at one database site can be communicated to each of the other database sites. Each parameter change is entered with time and date stamps to reference its value at a specified time and date. This information can be of use in generating system reports.

To provide additional features, the server **102** includes a customer profile component **150**, a music testing component **152**, an audience measuring component **154**, a promotions component **156**, an advertising component **160**, a listener feedback component **162**, and a transactions component **164**. Each of these components includes a computer program module or other form of software or firmware to direct the server **102** to provide its associated feature.

The customer profile component **150** stores and manages a table of end user data. The end user data includes a record comprising one or more of a name, an address, a login, an electronic mail address, preferences, and demographics for each end user. Examples of end users include listeners and other consumers, broadcasters, and promoters (e.g. record labels). Optionally, the customer profile component **150** purges a record after a predetermined period of inactivity of its associated end user.

Each record in the table has a unique identification code, herein referred to as CustomerID, to identify its associated end user. The customer profile component **150** performs a check to ensure that only one CustomerID is created for each user. The CustomerID is used throughout the system to identify a particular end user. Each end user enters his/her unique login to access his/her preferences when using the player **142**.

Several levels of customer profiles can exist. In a guest level, a generic CustomerID is created without requesting profile information. A message allowing a user to create a profile is presented whenever a customizing feature or a music testing capability is used. Listener feedback and advertising information is tracked for guests who do not create a profile. All such responses for guests are grouped together.

In a basic customer level, a CustomerID is created to provide the preferences capabilities of the system using a basic profile. A unique login name and password is included in the end user record. The login name and password is entered by the end user to access his/her profile. Specific demographic information may be requested from the end user before gaining basic customer status.

In a preferred customer level, a CustomerID is created with a more detailed profile than the basic customer level. In addition to the profile information in the basic customer level, the preferred customer level can require that an address of the end user be maintained in the end user record. In return, the end user is provided with exclusive features such as being enabled for promotions described herein.

The customer profile component **150** is provided to allow preferences to be available regardless of where the end user is accessing the system. For example, the end user can access the player **142** at either the client apparatus **106** or a client apparatus **104** using his/her preferences in the customer profile component **150**.

The music testing component **152** provides a user interface (also referred to herein as a listening booth or a rating room feature) for a music testing service. The music testing service allows record labels and other promoters to test new music releases. The music testing component **152** manages the mechanics of the testing.

The audience measuring component **154** monitors and records data associated with a listening behavior of each end user when using the player **142**. Based upon the data, one or more audience measurement reports are generated. The audience measurement reports may be of particular interest

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to music directors of radio stations. The audience measuring component **154** can provide a "Arbitron-like" rating system for radio on the Internet that is familiar to terrestrial radio broadcasters.

The promotions component **156** tracks the performance of promotions offered to elicit responses using the music testing component **152**. The promotions component **156** further manages the administration of the music testing component **152** in providing a delivery vehicle for promotional items such as rated albums

The advertising component **160** manages audible and visible advertisements presented by the player **142**. The audible advertisements can be inserted into the audio stream to replace audible advertisements played by a broadcaster (e.g. a radio station). The visible advertisements can be displayed in any of several areas of the display device **134**.

The listener feedback component **162** receives and manages feedback messages from end users. The feedback messages can pertain to the system for providing audio content, the broadcasters (e.g. radio stations), the content (e.g. events), or advertising. Preferably, the feedback messages are entered using the player **142**. The listener feedback component **162** identifies the content and/or the broadcaster presented to the end user at the time his/her feedback message was generated. Using this information, a suitable destination for routing the feedback message is determined. The listener feedback component **162** can include an electronic mail server to route the feedback messages. The listener feedback component **162** can further generate reports based upon the feedback.

The transactions component **164** is used to process transactions performed by end users and clients. Examples of transactions include end users purchasing content, and clients purchasing on-line reports. The transactions component **164** includes a database to record the transactions, and to process credit card information.

FIG. **2** is a first display window in an embodiment of the graphical user interface. As with the other herein-described display screens, display windows, and display regions, the first display window is displayed by the display device **134**. The first display window provides a primary browsing window to offer basic features including basic content selection control and playback control to the end user.

The first display window includes categorical selection controls **200**, preset selection indicators **202**, preset selection controls **204**, advance/review controls **206**, playback controls **210**, volume controls **212**, selection attribute indicators **214**, a streaming indicator **216**, a first display region **218**, an information control **220**, a second display region **222**, a search control **224**, a user feedback control **226**, a smart card control **230**, a help mode control **232**, a first logo **234**, a second logo **236**, an advertising window **240**, and an attractions window **242**.

Preferably, each of the aforementioned controls includes a hot spot region or a graphical button designated for receiving user-initiated selections and actions from the at least one input device **124**. Examples of user-initiated actions include, but are not limited to, point-and-click operations with a pointing device such as a mouse, a trackball, or a touchpad, and touch actions using a touchscreen or a keyboard.

The categorical selection controls **200** are designated to receive user-initiated actions to choose a content category within which audio content can be selected. The categorical selection controls **200** include a radio category control **244**, an events category control **245**, a library category control **246**, and a music category control **247**. Each of the categorical selection controls **200** is displayed as a graphical tab.

The radio category includes content available from over-the-air broadcasts (including but not limited to AM and FM broadcasts) and Internet broadcast material encoded and distributed through the electronic network **100**. The events category includes content from special occurrences, conventions, announcements, news, and sports events, for example, distributed by a scheduler or an event manager. The events category includes scheduled broadcasts of either live or archived material that is made available over the electronic network **100** at a scheduled time. The library category includes content from stored audio of books, archived speeches, spoken audio, and other content that appears without reference to a particular broadcast. The music category includes collections of music such as albums and other audio releases.

The radio category and the events category include content associated with a particular time, such as a live broadcast. The library category and the music category include content generally unreferenced to a particular time.

If, while material is active in a first content category, the end user proceeds to a second content category, the tab associated with the first content category is displayed with blinking text. In this case, the end user can proceed to the second content category using a point-and-click operation with the tab associated with the second content category or by use of the smart card. For example, if the radio category is active when the end user selects the music category tab, the radio category tab blinks until the end user returns to the radio category or until new material is streamed. When new material is chosen, the tab returns to its idle state.

To easily identify the active function, each of the four content categories are color coded. Preferably, the CMYK values of each content category is as follows: radio 0-49-96-0, events 23-96-100-9, library 79-7-100-0, and music 88-80-0-0.

If there is no selection of a content category, the text "INFO" is displayed in the information control **220**. In this case, the text "INFO" is displayed in a color such as grey rather than a second color such as black when a content category is selected. Alternatively, the information control **220** can be selected to display a guide on how to make a selection in the current mode.

The playback controls **210** includes a play button **250** and a cancel button **252**. The play button **250** is designated to receive a user-initiated action to initiate a playback of an audio selection. Text within the play button **250** is redisplayed in a reverse color upon receiving the user-initiated action. The reverse color indicates to the end user that the action has been received.

The default for the play button **250** is to automatically play titles and stations whenever available. If a title or a station cannot be played with chosen attributes, at least a portion of the play button **250** including the text "PLAY" is displayed in a first color such as grey. If a title or a station can be played with chosen attributes, the portion of the play button **250** including the text "PLAY" is redisplayed in a second color such as black. If an event has not yet occurred, the play button **250** displays the word "SCHEDULE".

During playback, the play button **250** is designated to receive a user-initiated action to pause the playback of the audio selection. Once paused, the play button **250** can receive a subsequent user-initiated action to continue the playback.

The cancel button **252** is designated to receive a user-initiated action to cancel an activity of the player. For

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example, when selecting items using a selection table (which is subsequently described in detail), the cancel button **252** can be selected to exit from the selection table. As another example, when playing an audio selection, the cancel button **252** can be selected to stop the playback of the audio selection and to reset the player to keep the audio selection chosen.

The advertising window **240** provides advertising images. The advertising window **240** can further provide backward and forward navigation of advertisements.

FIG. **3** is a display of a portion of the graphical user interface including the selection attribute indicators **214**. The selection attribute indicators **214** include a select button **260** and three attribute fields **262**, **264**, and **266**. The select button **260** is designated to receive user-initiated actions to alternate between the three attribute fields **262**, **264**, and **266**.

For radio content, the three attribute fields **262**, **264**, and **266** include a category attribute field, a band attribute field, and a location attribute field. For events, the three attribute fields **262**, **264**, and **266** include a category attribute field, a time attribute field, and an event attribute field. For library content, the three attribute fields **262**, **264**, and **266** include a category attribute field, an author attribute field, a title attribute field. For music content, the three attribute fields **262**, **264**, and **266** include a category attribute field, an artist attribute field, and a title attribute field.

A selection of the select button **260** directs the next attribute field to be displayed along with its associated options. For example, clicking the select button **260** while the band attribute field **264** is active causes the location attribute field **266** to become active, as illustrated.

A list of options **270** associated with an active attribute is displayed next to the three attribute fields **262**, **264**, and **266**. The end user can scroll through the list using a scroll bar **272**, an up scroll control **274**, and/or a down scroll control **276**. The end user can also navigate to an option by entering either a letter or a number of an item in the list of options **270**.

When an intended option is highlighted (such as "Chicago" as illustrated), the end user can select the option by either: (i) double clicking on the option; (ii) clicking on the select button **260**; (iii) selecting another attribute to choose, or (iv) clicking on the play button **250** if all the attributes are chosen. Once chosen, the intended option is displayed in its respective one of the three attribute fields **262**, **264**, and **266**. If the cancel button **252** is selected at any time in this operation, no attribute is chosen and the player is reset to either a previous state or to an idle state.

Optionally, attributes can be selected from a personalized set of options so that a list of likely choices is smaller than a full set of options, and is filled with items more likely of interest.

It is noted that, except where noted, the list of options for each attribute includes an "ALL" option. Content is unfiltered with respect to an attribute having the "ALL" option. If a user-initiated selection of the select button **260** is received without receiving a user-initiated selection of an option from the list of options **270**, the attribute is automatically set to "ALL".

Referring back to FIG. **2**, the preset selection indicators **202** and the preset selection controls **204** provide a graphical user interface for operating presets. The preset selection indicators **202** display a subset of the available presets. The preset selection controls **204** control which subset of the available presets is displayed. The preset selection controls **204** include an up arrow control and a down arrow control to scroll up and down, respectively, in the available presets. As an arrow control is clicked, the available presets scroll such that preset buttons **290**, rather than the text therein, visually appear to move.

Presets acts as filters to easily comb through available content for specific, frequently-used material. Presets may be used to store access to specific content or titles, or may be used to specify sets of titles. For example, a first preset can specify a set of all stations that broadcast jazz, and a second preset can specify all recordings of a particular artist. Presets are available as preferences to users of the same client apparatus, and are available across different client apparatus with the use of a smart card (either physical or virtual).

A different set of presets exists for each content category (radio, events, library, and music). If desired, each content category can have a predetermined number of presets (such as twenty, for example) associated therewith. In general, a preset made for a particular content category may not appear as a preset for another content category.

Alternatively, presets can be used across more than one content category, such as for all content categories. In this case, each preset can be assigned a priority within a content category. A border color for a preset selection indicates the content category to which it refers.

A preset can be stored by dragging the cursor from the selection attribute indicators **214** to a preset title bar **292** when a title is active. In this case, the set of attributes is stored in a next available preset. If no presets are available, the end user is prompted to overwrite a preset or to abandon the request to store the preset.

Another way to store a preset is to click and hold one of the preset selection indicators **202** for a duration that exceeds a predetermined threshold. In a preferred embodiment, the predetermined threshold is about one second. Thereafter, a window is displayed to query if the end user wants to store attributes to the selected one of the preset selection indicators **202**, or to delete a preset associated with the selected one of the preset selection indicators **202**. The attributes are stored in response to a first user-initiated action using the window. The preset is deleted in response to a second user-initiated action using the window.

A further way to add a preset is by a user-selection of an attraction from the attractions window **240**. The attractions window **240** provides rotating attractions in the form of presets. The attractions can include advertisements for content. The end user can click on an attraction to add its associated preset to the presets.

Optionally, controls can be provided to rearrange stored presets, and to select either a set of attributes or a specific station or title to store as a preset. As another option, the presets can have functionality that supercedes any function change so that a specific preset is active throughout the entire system. These presets also can be rearranged by the end user.

Displayed within each of the preset selection indicators **202** are two lines of text with twelve characters per line. For a radio station preset, the text includes call letters and a frequency of the radio station. For an event preset, the text includes as much of an event title that can fit within its preset selection indicator. For a library preset and a music preset, the text includes the first twenty-four letters of the title. With use of the smart card (either physical or virtual), a user is provided an option to edit the titles.

FIG. **4** is an illustration of an embodiment of the streaming indicator **216**. The streaming indicator **216** is displayed

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whenever an encoded stream is being decoded in accordance with a streaming technique. The streaming indicator **216** provides a bar graph display representing a percentage of the encoded stream being decoded. In essence, the streaming indicator **216** provides a streaming strength meter showing how close decoded audio is to original audio encoded in the stream.

Also, the streaming indicator **216** provides an indicator of player activity through a resulting flickering thereof. When transmission of data via the electronic network **100** is stalled, one segment **300** of a plurality of segments **302** is displayed in a first color, such as red. When the electronic network is not congested, two or more of the segments **302** are displayed in a second color, such as green.

The streaming indicator **216** also includes two textual indicators **304** and **306** to the right of the segments **302**. The textual indicator **304** indicates whether the audio signal is separated into stereo channels. The textual indicator **306** indicates a transportation mode for receiving the encoded stream.

With an activated help mode (as subsequently described in detail), the streaming indicator **216** provides a control to receive a user-initiated action to display transmission statistics. For example, upon clicking the bar graph, the percentage of the encoded stream used to generate the bar graph is displayed in a numerical form. The numerical form of the percentage is repeatedly updated for a duration of about three seconds. Thereafter, the numerical form is replaced with the bar graph.

To provide an indication that a stream is beginning and that a buffer is being filled, each function includes a dial or scale. The dial or scale fills from opaque to solid from left to right to indicate how much of the buffer is filled. In this way, the left side of the dial begins filling when buffering begins, and reaches the right side of the dial when buffering has completed. At this time, play of the audio is commenced.

Also, while loading, a textual indication of system action can be displayed. Examples of system actions which can be displayed include, but are not limited to, a "calling server" action and a "loading file" action. If an error occurs when attempting to locate a streaming file, an error message is displayed at the location of the bar graph.

FIG. **5** is an illustration of an embodiment of the volume controls **212**. The volume controls **212** include a plurality of like shapes having different sizes. Each of the shapes is dedicated to receive a user-initiated selection to playback the audio with a volume monotonically related to its size. As illustrated, the shapes can include circles having five different radii. In this case, each larger circle commands a louder volume. Muting the volume is commanded by clicking on the smallest circle. Advantageously, the end user can rapidly adjust the volume from soft to loud with having to go to progressively larger circles.

Referring back to FIG. **2**, it is noted that the size of the first display window can be adjusted by the end user, if desired. Preferably, the first display window can be fully displayed within a browser window without requiring scrolling. It is also preferred that the player be capable of providing a collapsed mode view of the first display window. The collapsed mode view may expose only the presets, for example. The collapsed mode view is amenable for use as a desktop player.

Preferably, all of the aforementioned controls have a phrase or description associated therewith to provide assistance to the end user. A default in the player is to provide an activated help mode, wherein a phrase or description associated with a control is automatically displayed when a cursor is maintained at the control for a predetermined duration such as a second.

The help mode control **232** is designated to receive user-initiated actions to activate and deactivate the help mode. To deactivate the help mode, the end user selects the help mode control **232**. When deactivated, the help mode control **232** is displayed without the question mark. To reactivate the help mode, the end user selects the help mode control **232** again. When activated, the help mode control **232** is displayed with the question mark.

FIG. **6** is an illustration of an example of a portion of the display window upon receiving a user-initiated selection of the radio category control **244**. In the radio category, a graphical radio dial **330** is displayed. The graphical radio dial **330** resembles an analog dial for AM and FM broadcasts. A graphical pointer **332** indicates a current position on the graphical radio dial **330**. Preferably, the graphical pointer **332** is shaped as a graphical needle.

Above and below the graphical pointer **332** are text boxes **334** and **336** containing information about a radio station at the current position. The information can include call letters **340**, a frequency **342**, a format **344**, and a city of origin **346** associated with the radio station. As the graphical pointer **332** is moved from station to station, the information in the text boxes **334** and **336** is updated accordingly.

If a plurality of radio stations exist close to one another, a number of dashes **350** indicative of how many radio stations exist are displayed. A plurality of marks **352** (each having the form of a half-circle) are used to separate available radio stations. The number of the marks **352** can be limited to a limit such as fifteen, if desired.

If a plurality of radio stations exist at the same frequency, a number of the marks **352** indicative of how many radio stations exist at the frequency is displayed to extend down from the frequency location. For example, if two radio stations exist at a frequency, two half circles are displayed at that frequency. Scanning through these stations present each station sequentially in call-letter alphabetical order.

A radio station which does not transmit over the electronic network **100** may appear in a slot on the graphical radio dial **330** to indicate its existence. To indicate that the radio station does not currently broadcast over the electronic network **100**, a message or other indicator is displayed.

Optionally, a city guide corresponding to a city for the radio station can be displayed. For example, if the graphical radio dial **330** provides a radio dial for San Francisco radio stations, an option (not illustrated) can be user-selected to initiate a display of the city guide for San Francisco.

FIG. **7** is an illustration of an example of the graphical radio dial **330** for selecting Internet or other electronic network broadcasts. In this case, the graphical radio dial **330** has indicia to alphabetically sort the Internet broadcasts by an identification text. For example, ESPNet SportsZone content is located when the graphical pointer **332** is at "E", and C|NET content is located when the graphical pointer **332** is at "C". A text box **360** above the graphical pointer **332** displays the text identifying the audio content (such as "ESPN", for example). A text box **362** below the graphical pointer **332** displays the format and the country of origin of the audio content.

With reference to both FIG. **6** and FIG. **7**, the graphical user interface provides multiple ways to navigate to a radio station or an Internet broadcast. One way includes using the selection attribute indicators **214** to select a plurality of stations having chosen attributes, followed by tuning the dial

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to one of the stations. Attribute selection is performed in a manner described with reference to FIG. 3. In the radio category, selection of an "ALL" option produces all categories of stations that broadcast on FM from anywhere in the world.

The band attribute field **264** allows the end user to specify which band is to be displayed by the graphical radio dial **332**. This is a required attribute to be performed in the first step. The bands include AM, FM, (representing stations that primarily broadcast by AM and FM, respectively) and Internet (representing broadcasts only available from the Internet). The default option is FM.

The category attribute field **262** allows the end user to limit the dial to at least one particular category or format. A plurality of categories or formats can be selected by holding down the shift key while selecting the options. In this way, the end user can repeatedly select options from the list without forcing the attribute selection to move to the next field. Text displayed within the category attribute field **262** includes the first chosen category followed by dots to indicate more than one category.

FIG. **8** is an example illustration of using the location attribute field **266**. The location attribute field **266** allows the end user to limit the dial to stations having a specified location. Stations that broadcast on the Internet are dependent upon country only. A list of options **370** for the location attribute is segmented into three fields: city **372**, state **374**, and country **376**. Displayed at the top of the list are headings **382**, **384**, and **386** which can be selected to initiate an alphabetical sort of the options **370** by city, state, and country, respectively. The current field by which the options **370** are sorted is indicated by underlining its associated heading (e.g. the heading **382** is illustrated as underlined to indicate that the options **370** are alphabetically sorted by city). If, for example, the end user wished to have the options **370** sorted by state, he/she could click on the heading **384**.

For options not having an associated state, which can occur for some countries in the world, the field for the state **374** is left blank. These options are displayed at the top of the list of options **370**.

A plurality of locations can be selected by holding down the shift key while selecting locations. In this way, the end user can repeatedly select locations from the list without forcing the attribute selection to move to the next field. Text displayed within the location attribute field **266** includes the first chosen location followed by dots to indicate more than one location.

A radio station is automatically played once a station or a set of stations are selected and displayed. A first station, which preferably is the left-most station on the graphical radio dial **330**, or a commercial business can determine which station is to be played first if a set of stations is selected.

It is noted that any of the aforementioned attributes can be modified while a station is being played. When the modified attributes do not include the current station, the graphical radio dial **330** is redisplayed without the current station, and playback of the first station on the graphical radio dial **330** is initiated.

A second way to navigate to a radio station or an Internet broadcast using the graphical user interface includes the advance/review controls **206**. A user-initiated selection of an advance control **390** advances from a currently active station to a station disposed rightward therefrom on the graphical radio dial **330**. A user-initiated selection of a review control **392** changes from a currently active station to a station disposed leftward therefrom on the graphical radio dial **330**. A user-initiated selection of one of the marks **352** navigates to a station associated therewith. Regardless of the manner to which the radio station is navigated, streaming of the radio station is initiated upon its selection.

A third way to navigate to a radio station or an Internet broadcast is to use presets. As described with reference to FIG. **2**, the presets are available to access frequently-used radio stations. If the preset attributes include more than one option per attribute, that attribute is used to populate the text of those sets. Each preset button may display up to two items of characteristics which define its associated radio station or group of radio stations.

A fourth way to navigate to a radio station or an Internet broadcast is to use a smart card (either physical or virtual). In addition to or as an alternative to storing preferences, a smart card can be used by a promoter to allow the end user easy or unrestricted access to particular content. When a smart card for a particular station is made active, the station or group of stations is presented within the graphical radio dial **330**. If the attribute options include more than one item, that attribute reads the associated text. Any activity controlled by a smart card is represented by an oblique version of the font for displaying a function text label (i.e. the "radio" label in the radio content control **244**, the "events" label in the events category control **245**, the "library" label in the library category control **246**, and the "music" label in the music category control **247**). The smart card control **230** displays the title of the smart card.

FIG. **9** is an example of the second display region **222** providing auxiliary information about a particular station. The auxiliary information is displayed in response to receiving a user-initiated selection of the information control **220**. The auxiliary information can include a title of a current song being played by the station, an artist associated with the song, an album containing the song, a label for the song, and an image of the album cover art. An option **402** is designated to receive a user-initiated event to display more auxiliary information about the song. An option **404** is designated to receive a user-initiated event to purchase the song or an album containing the song. An option **406** is designated to receive a user-initiated event to display a programming guide.

The auxiliary information can also include promotional advertising provided by the station, such as a logo **410** or another image, and one or more links to related sites on the electronic network. The logo **410** acts as a control to initiate a hyperlink to a destination in the electronic network **100**, such as to a home page of the radio station. Another window is opened to present information from the destination.

FIG. **10** is an example of a programming guide in the second display region **222**. The programming guide includes a planned schedule of the radio station in a list format. The list includes days of the week and times for the programming. Active content **420** is emphasized with bold typeface. Specific events listed in the programming guide can provide links to archived material. Clicking on or otherwise selecting a link brings the end user to the events category with the attributes populated for an event corresponding to the link. Optionally, the programming guide can accept inputs to display the schedule for other times throughout a day or week. Future events can be scheduled in this way.

When no station is active, the second display region **222** may be used to display an advertisement. The advertisement can be provided as a viewing object while streaming buffering occurs. When there is a period of inactivity for the

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player, the second display region **222** can resume displaying advertising for a station or another business entity.

It is noted that the radio category can optionally provide additional functionality not specifically illustrated in the drawings. Examples of additional functionality include: (i) a call button in the main area of the interface to initiate an Internet telephone call between the client apparatus **106** and the radio station, (ii) options to support a chat room among listeners of a radio station, (iii) a presentation of player information in languages other than English, (iv) a "show map" option for choosing a location using a graphic representation having mapped zones to represent cities or regions of the country and world; (v) a feedback mechanism to rate the station as a whole, a playlist, a disk jockey, or a current song with a 1 to 10 pick list on a station information screen; and (vi) a comment line that allows the end user to submit text to the station with or without the aforementioned rating.

FIG. **11** is an illustration of an example of a portion of the interface displayed upon receiving a user-initiated selection of the events category control **245**. In the events category, a graphical time scale **450** is displayed. A time marker **452** indicates, for an event, a current time position on the graphical time scale **450**. The current time position is gauged relative to a time the event occurred. An indication **454** of a time standard or a time zone is displayed to the right of the graphical time scale **450**.

An indication **456** is displayed if the event is live. If the event is archived, the indication **456** is replaced by the date that the event occurred.

A start time **460** and an end time **462** on the graphical time scale **450** may be specified in a preference. However, the default is to present the start time **460** and the end time **462** based on the actual occurrence of the event. Alternatively, a timeline indicating an amount of time that the end user has been listening to the event can be displayed. This timeline is preferred in cases where there is an inaccurate record of the original recording.

For live events having an uncertain length (e.g. a sporting event), an estimated timeline is initially displayed. Should the duration of the event go beyond the estimated timeline, an updated timeline is displayed with a start time set to the end time of the estimated timeline.

For an archived event, the time marker **452** can be advanced and reversed using the advance/review controls **206**. For a live event, the advance/review controls **206** are not active. To indicate this to the end user, the advance/review controls **206** are displayed in a first color, such as grey, rather than a second color, such as black, for a live event.

The graphical user interface provides multiple ways to navigate to an event. One way includes using the selection attribute indicators **214** to select an event having chosen attributes. Attribute selection is performed in a manner described with reference to FIG. **3**. In the events category, selection of an "ALL" option produces a list of all events.

The category attribute field **262** allows the end user to limit the events to at least one particular category or format. A plurality of categories or formats can be selected by holding down the shift key while selecting the options. In this way, the end user can repeatedly select options from the list without forcing the attribute selection to move to the next field. Text displayed within the category attribute field **262** includes the first chosen category followed by dots to indicate more than one category.

FIG. **12** is an example illustration of using the time attribute field **264**. The time attribute field **264** allows the end user to specify a date and a time period at which the event is either scheduled to occur or has occurred. Several options can be made available to specify specific dates. One option is to display a calendar **470** in the first display region **218** for selecting a day or a block of days. A day is selected by navigating the calendar **470** to the day, and clicking on the day. A block of days is selected by clicking on a first date while holding the shift key, and then clicking on the ending date.

FIG. **13** is an example illustration of using the event attribute field **266**. Upon selecting the event attribute field **266**, a list of events **480** defined by the category attribute field **262** and the time attribute field **264** is displayed. The list of events **480** has a first column to display the name of the event, and a second column to display the date and start time of the event. Displayed at the top of the list are headings **482** and **484** which can be selected to initiate an sort of the events **450** by event name (alphabetically) or by start time (numerically), respectively. The current field by which the events **480** are sorted is indicated by underlining its associated heading (e.g. the heading **482** is illustrated as underlined to indicate that the events **480** are alphabetically sorted by event name). By default, the events **480** are sorted by event name.

A second way to navigate to an event is to use a preset. As described with reference to FIG. **2**, some presets are dedicated to access events. If a preset specifies a category attribute and a time attribute rather than an event, the event attribute list is made active upon selecting its preset button. Thereafter, the end user can select an event from the list. If a preset specifies an event, the event will begin to play upon selecting its preset button as soon as the file is available.

A third way to navigate to an event is to select an archived or a scheduled event from a radio station programming guide. In response to receiving a user-initiated selection of an event from the programming guide, the graphical user interface provides the events category. The event attribute field **266** is populated with the selected event. Playback of archived events is automatically initiated. For scheduled events, a prompt to receive a user-initiated selection of a notification method is provided.

FIG. **14** is an illustration of an example of a notification prompt. If an event has not occurred at the time of selection, but is scheduled to occur subsequent to the time of selection, a notification options window **490** is displayed rather than the graphical time line. Although not illustrated, the streaming indicator **216** indicates the status of the event (such as not yet occurred) in this case. Further, the play button **250** is modified to display the word "SCHEDULE" as a confirmation that the event is scheduled. If the end user has not provided scheduling preferences, a prompt to enter the preferences is displayed. The schedule and the preferences are stored to a preferences smart card (either physical or virtual).

The notification options window **490** provides three options. A first option is to send a message to the end user before the event occurs. For example, the message can be sent a predetermined number of minutes before the event. The message can include an electronic mail message sent to the client apparatus **106** or a paging message sent to a pager associated with the end user. A second option is to automatically activate the player, if the client apparatus **106** is activated, at the time of the event. A third option is to record the event for subsequent playback. In this case, the recorded event becomes a preset for later access. Text associated with the preset button is displayed in a bold typeface. If an event

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is not yet available, an indication thereof can be provided. If an archive of the event is no longer available, the preset is automatically removed.

It is noted that a personal notification message can be sent to an end user without use of the aforementioned notification prompt. In this case, a notification message is sent to the end user for an event or a program which may be of interest based upon listening behavior or other activity of the end user. Hence, in general, the server **102** can provide personal notification for content that is broadcast at a scheduled time based upon either an expressed interest of the end user (e.g. through the aforementioned active marking for content using the notification prompt) or a passive interest of the end user (e.g. through monitoring of user activity).

A fourth way to navigate to an event is to use a smart card (either physical or virtual). The smart card can allow access to specific events as promotions, for example. When a promotional smart card is made active, the content specified in the card is used to populate attributes in the player. Any text populated by a smart card is represented by an oblique version of the font for displaying a function text label.

Smarts cards (either physical or virtual) also facilitate access to specific events as part of a playlist. In this case, the end user can specify and save a playlist of events to the smart card. The playlist is used to control the player. The playlist may jump to different selections, in which case the text of the selection is presented in an oblique font. It is noted that the playlist information stored can be separate from a physical or a virtual smart card. For example, the playlist information can be stored by the storage device **116** of the server **102** or by the storage device **132** of the client apparatus **106**.

FIG. **15** illustrates an example of the second display region **222** displaying auxiliary information about an event. The auxiliary information is displayed in response to receiving a user-initiated selection of the information control **220**, which includes the text "EVENT INFO" for events.

The auxiliary information is dependent upon the type of the event. Examples of default information include an original time of the event, a location, guests, and topics. For example, with a sporting event, the auxiliary information can include team logos **500** and **502**, a current score for the sporting event, players, hosts, guests, and links to sites related to the event. Linking to one of the sites causes another window to be opened.

It is noted that the events category can optionally provide additional functionality not specifically illustrated in the drawings. Examples of additional functionality include: (i) substituting the event attribute field **266** with a different attribute field, such as a location attribute field, and providing a time line with marks representing the union of events; (ii) temporally arranging events on the timeline so that an event can selected in a manner similar to the graphical radio dial (allowing the end user to rapidly alternate between two selections), (iii) inserting advertising in the form of markers at predetermined locations along the time scale (allowing the end user to go to another site when there is a pause in the event without losing track of where they are in the event), (iv) a feedback mechanism to rate the event as a whole, the subject of the event, a particular participant in the event, or the broadcast of the event with a 1 to 10 pick list on an event information screen; and (v) a comment line that allows the end user to submit textual feedback with or without the aforementioned rating.

FIG. **16** is an illustration of an example of a portion of the interface displayed upon receiving a user-initiated selection of the library category control **246**. In the library category, a graphical time scale **520** is displayed. A time marker **522** indicates a current time position, for a library content selection, on the graphical time scale **520**. The graphical time scale **520** represents a total time **524** for the selection. The time marker **522** can be moved manually using the pointing device or can be moved using the advance/review controls **206**.

The graphical user interface provides multiple ways to navigate to content in the library category. A first way includes using the selection attribute indicators **214** to select content having chosen attributes. Attribute selection is performed in a manner described with reference to FIG. **3**. In the library category, selection of an "ALL" option produces a list of all library content.

The category attribute field **262** allows the end user to limit the library content to at least one particular category or format of spoken audio. A custom attribute allows a plurality of categories or formats can be selected by holding down the shift key while selecting the options. In this way, the end user can repeatedly select options from the list without forcing the attribute selection to move to the next field. It is noted that categories can be specialized with options such best sellers and reviews.

The author attribute field **264** allows the end user to specify an author of the content. Work that is absent of an author (such as non-book material) can have a lead person in the work listed as an author. Upon selecting the author attribute field **264**, a list of authors having content limited to the category specified in the category attribute field **262** is displayed. The end user can select an author from the list.

Upon selecting the title attribute field **266**, a list of titles that satisfy the parameters specified in the category attribute field **262** and the author attribute field **264** is displayed. The end user can select a title from the list.

FIG. **17** shows an example of text in the fields **262**, **264**, and **266** associated with the aforementioned approach to navigating to library material. When information in a field is longer that the width of the field, the full text of the information is available by maintaining a cursor on the field. In response to this user-initiated event, the width of the field is expanded to accommodate the full text.

A second way to navigate to library content is to use a preset. As described with reference to FIG. **2**, some presets are dedicated to the library section. Upon selecting a preset button, attributes specified by its corresponding preset are used to populate the attribute fields **262**, **264**, and **266**. If the preset defines a set of titles, the user can select one of the titles using the title attribute field **266**.

A third way to navigate to library content is to use a smart card (either physical or virtual). The smart card is used to populate attributes in the player. Thereafter, the user is presented with the content cued and ready to play, or is presented with a list of titles to select from. The smart card can allow access to otherwise unavailable content that is made available through privileges stored in the smart card. During smart card operation, the Library function label is displayed using an oblique font.

Smarts cards also facilitate access to specific titles as part of a playlist. In this case, the end user can specify and save a playlist of titles to the smart card. The playlist is used to control the player. The playlist is amenable for transfer between the end user and another end user, and between a plurality of access points for the end user. When an item from a playlist is selected, its attributes populate the attribute fields **262**, **264**, and **266**, and the item is cued for play.

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Regardless of the method of navigating to a title, the graphical user interface can provide indicators and controls to provide access to specific chapters or sections of the material in a manner similar to tracks of a compact disk. A time indicator can be displayed at the top of the time scale relative to each particular segment or relative to the time from the beginning of the material. As illustrated in FIG. **18**, an indicator **540** of which chapter is current and the number of chapters that exist is displayed at an end of the time line. Clicking on the indicator **540** presents a pick list of chapters.

Cueing to another part of the content can be performed using the advance/review controls **206** to advance through the time bar. When advanced beyond the length of a chapter, a subsequent chapter is provided. Holding down the advance/review controls **206** advances or returns to other chapters.

Alternatively, tags marking specific content on the time bar can be user-selected to advance to specific content. Further, a user initiated selection of a point on the time line moves the time marker to the point.

Optionally, the time marker can have specially-encoded material associated therewith to allow for users to find specific segments. This is beneficial in educational applications. Another option is to provide titles of chapters rather than chapter numbers in the indicator **540**. Links to reviewers or other comments can be embedded in the time scale to allow the end user to pause and reflect on the current material.

FIG. **19** illustrates an example of the second display region **222** being used to provide auxiliary information about a title. The auxiliary information is displayed in response to receiving a user-initiated selection of the information control **220**, which includes the text "TITLE INFO" for library content. The auxiliary information can include specific information for the title, a summary of the title, a table of contents, credits, comments on the title, accompanying text, links to reviews of the title, links to related areas, an image **550** of the author(s), and an image **552** of the cover of a book, for example.

It is noted that the library category can optionally provide additional functionality not specifically illustrated in the drawings. Examples of additional functionality include (i) a feedback mechanism to rate the title as a whole, the author, reading or translation of the title with a 1 to 10 pick list on a library information screen, and (ii) a comment line that allows the end user to submit textual feedback with or without the aforementioned rating.

FIG. **20** is an illustration of an example of a portion of the interface displayed upon receiving a user-initiated selection of the music category control **247**. In the music category, a graphical time scale **600** is displayed much like the graphical time scale **520** for the library category. A time marker **602** indicates a current time position for a music selection, such as an album or a song, on the graphical time scale **600**. The graphical time scale **600** represents a total time **604** for the music selection. The time marker **602** can be moved manually using a click-and-drag operation with a pointing device or can be moved using the advance/review controls **206**.

The graphical user interface provides multiple ways to navigate to content in the music category. A first way includes using the selection attribute indicators **214** to select content having chosen attributes. Attribute selection is performed in a manner described with reference to FIG. **3**. In the music category, selection of an "ALL" option produces a list of all music content.

The category attribute field **262** allows the end user to limit the library content to at least one particular category or format. Traditional categories and formats of music (e.g. rock, jazz, pop, etc.) can be provided. A plurality of categories or formats can be selected by holding down the shift key while selecting the options. In this way, the end user can repeatedly select options from the list without forcing the attribute selection to move to the next field.

The artist attribute field **264** allows the end user to specify an artist of the content. Upon selecting the artist attribute field **264**, a list of artists having content limited to the category specified in the category attribute field **262** is displayed. The end user can select an artist from the list.

Upon selecting the title attribute field **266**, a list of titles that satisfy the parameters specified in the category attribute field **262** and the artist attribute field **264** is displayed. The end user can select a title from the list. The list of titles can include album titles and song titles.

When information in one of the fields **262**, **264**, and **266** is longer that the display width of the field, the full text of the information is available by maintaining a cursor on the field. In response to this user-initiated event, the width of the field is expanded to accommodate the full text.

A second way to navigate to music content is to use a preset. As described with reference to FIG. **2**, some presets are dedicated to the music section. Upon selecting a preset button, attributes specified by its corresponding preset are used to populate the attribute fields **262**, **264**, and **266**. If the preset defines a set of titles, the user can select one of the titles using the title attribute field **266**.

A third way to navigate to music content is to use a smart card (either physical or virtual). The smart card is used to populate attributes in the player. Thereafter, the user is presented with the content cued and ready to play, or is presented with a list of titles to select from.

Smarts cards also facilitate access to specific titles as part of a playlist. In this case, the end user can specify and save a playlist of titles to the smart card. The playlist is used to control the player. The playlist is amenable for transfer between the end user and another end user, and between a plurality of access points for the end user. When an item from a playlist is selected, its attributes populate the attribute fields **262**, **264**, and **266**, and the item is cued for play.

Regardless of the method of navigating to a title, the graphical user interface can provide indicators and controls to provide access to specific tracks, sections, or parts of the music. As illustrated in FIG. **21**, an indicator **620** of which track is current and the number of tracks that exist is displayed at an end of the time line. Clicking on the indicator **620** presents a pick list of tracks.

Cueing to another part of the music content can be performed using the advance/review controls **206** to advance through the time bar. Holding down the advance/review controls **206** for more than a predetermined time duration (such as one second, for example) advances or returns to other tracks immediately. A user-initiated selection of a point on the time line moves the time marker to the point.

Optionally, the time marker **602** can have specially-encoded material associated therewith to allow for users to find specific songs or other segments. Another option is to provide titles of songs and/or credits rather than track numbers in the indicator **620**. Controls can be provided to allow titles in an album to be rearranged for playback.

Referring back to FIG. **2**, the second display region **222** can be used to provide auxiliary information about music content. The auxiliary information is displayed in response to receiving a user-initiated selection of the information

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control **220**, which includes the text "ALBUM INFO" for music content. The auxiliary information can include specific information for the current title such as album cover graphics, liner notes, tray back images, images of the artist(s), producer and writer credits, and distribution label information, for example.

It is noted that the music category can optionally provide additional functionality not specifically illustrated in the drawings. Examples of additional functionality include: (i) a feedback mechanism to rate aspects of the music such as the artist, the album, a song, and a producer, using a 1 to 10 pick list on a music information screen, (ii) a comment line that allows the end user to submit textual feedback with or without the aforementioned rating; and (iii) an ability to receive, decode, and display streamed music video in the second display region **222**.

FIG. **22** illustrates an example of a search feature provided in the second display region **222**. The search feature is activated in response to receiving a user-initiated selection of the search control **224**. If the user-initiated selection is received while the search feature is active, herein-described search fields are reset.

The search feature receives a user-entered search string. The search string is displayed at a location **630**. The search string includes one or more keywords which can have the form of a Boolean expression. A list of keywords can be combined using a "+" character. To limit the selection to one of the keywords, a "−" character precedes the keyword. Generally, the keywords are case insensitive.

Using the search string, a search of a database is performed in dependence upon user-selectable search criteria. The database can be provided by the server **102** and/or the server **144**. The search criteria limits where to search in the database for the search string. The search criteria includes fields for the radio category, the events category, the library category, and the music category. Each search criterion can be activated and deactivated using a graphical check box associated therewith. An "x" character is displayed at the graphical check box to indicate that its associated search criterion is activated. As a default, all search criteria are activated.

A first button **632** is responsive to a user-initiated selection to provide further fields to be searched. The first button **632** can be subsequently selected to provide still further fields to be searched. Each additional field provided in response to the first button **632** is activated by default. The end user can deselect the activated fields if desired. A second button **634** is responsive to a user-initiated selection to provide fewer fields to be searched.

The search is performed in response to a user-initiated selection of a button **636**. Results of the search are displayed in the second display region **222**.

FIG. **23** illustrates an example of search results displayed in the second display region **222**. The search results are sorted by category (in the order of radio, events, library, and music). Preferably, items are color-coded in dependence upon its category. Within each category are three attribute headings. Search results within each category can be sorted by an attribute by selecting its associated one of the attribute headings.

A first button **640** is responsive to a user-initiated selection to return to the previously set search fields (including the search string and the search criteria). The end user can modify the search fields to modify the search. A second button 642 is responsive to a user-initiated selection to reset the search fields to perform a new search.

FIG. **24** illustrates an example of a listening booth feature provided in the second display region **222**. The listening booth feature is activated in response to receiving a user-initiated selection of the user feedback control **226**. The listening booth feature can provide a venue for new music by relatively unknown talent. End users listen to the music, and provide user feedback to a service via the electronic network **100**. In return, the service provides the end user with an incentive, such as a complimentary copy of the music, a coupon, T-shirt, or other promotional item. Each end user rates music based upon a user preference parameter, such as a most-listened category for the end user. In general, any audible material can be rated, including but not limited to albums, playlists from radio stations and experimental audible material.

The listening booth feature provides an option **650** to view directions therefor. In response to a user-initiated selection of the option **650**, the directions are displayed in the second display region **222**. The directions can include example screens to explain use of the listening booth feature.

Upon each return to the listening booth feature, a status of the end user is displayed. The end user is registered at the server **102** through an active preferences smart card. The status can include a number of albums rated by the end user, and/or a remaining number of albums to receive a complimentary album.

The status information includes information about the end user, which may be stored via the preferences smart card. If this information is not present, the user is prompted to make a preferences smart card active or to create a preferences smart card. The preferences smart card provides a method of tracking listening preferences of the end user in order to determine which albums to present in the listening booth feature.

FIG. **25** is an example of a second display for the listening booth feature. The second display is presented upon confirming the identity of the end user, such as by receiving a password in the first display.

The second display provides several categories of music content from which to select. These categories are determined through past listening behavior of the end user. An option **660** can be selected to provide additional, different categories. The option **660** can be repeatedly selected to repeatedly provide more categories.

A user-initiated selection of text or graphics associated with one of the categories is received to select a category. The text can include a radio station associated with the category the end user has a radio preset for the category. The graphics can include an album cover of a typical album in the category.

FIG. **26** is an example of a third display for the listening booth feature. The third display is presented upon a user-initiated selection of one of the categories in the second display.

The third display includes at least one image **670** associated with a music selection from the category. The at least one image **670** can include a slide show based on liner notes, a CD tray back image, or a random image, for example. The third display also includes textual information including an artist, an album, a producer, a label, and a copyright associated with the music selection.

The music selection is loaded into the attributes. Based on user preferences, the tracks can automatically begin playing when queued. The music selection can include samples of a few seconds from each track on an album, for example. During playback, the end user enters a rating using a control

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674. The control includes 674 a marker 676 that is manipulated with respect to a numerical scale 680. The numerical scale 680 can run between two numerical limits, such as from 0 to 100.

Upon completion of playing the samples, the user-entered rating is recorded and the music selection is counted as being rated by the end user. If no rating has been entered, no rating is recorded. If the end user exits the listening booth feature during playback, the raling is not recorded. A rating can be canceled by a user-initiated selection of the cancel button 252.

As an alternative to a numerical rating, a graphical representation of rating can be employed. The graphical representation can be repeatedly gauged throughout the music selection. In this way, specific aspects and specific tracks of the music selection can be rated.

Referring back to FIG. 24, a control 690 can be selected by the end user to view previously reviewed albums. FIG. 27 is an example display provided upon selecting the control 690. The display includes a list 692 of each album reviewed by the end user. An album title 694, an artist 696, a copyright 700, a date 702, and an icon 704 are displayed for each album. The icon 704 can be selected to view images and credits, and to hear an audio clip of the samples for its associated album.

An example of a portion of the interface displayed upon selecting the icon is depicted in FIG. 28. As illustrated, the at least one image 670, the textual information 672, the marker 676, and the numerical scale 680 showing the rating are displayed as in FIG. 26. Additionally, a date 720 on which the album was rated is displayed. An option 722 is dedicated to receive a user-initiated event to initiate playback of the samples. An option 724 is dedicated to receive a user-initiated event to return to the previous screen.

Once the number of albums rated by the end user has attained a predetermined number, the end user can request a complimentary copy by selecting any one of the albums in the list. A dedicated button (not illustrated) can be selected to request that the complimentary copy be shipped to an address of the end user.

FIG. 29 illustrates an example of a card organizer display for a smart card feature. The smart card feature is activated in response to receiving a user initiated selection of the smart card control 230. The card organizer display is displayed within the second display region 222.

There are four types of smart cards (either physical or virtual) that can be used in the system. The four types of smart cards include a preferences smart card, a promotions smart card, a playlist smart card, and a payment smart card.

A preferences smart card or a personality smart card stores identity, demographics, presets, defaults, payment options and preferences, and event schedules for an end user. The preferences smart card is read/write and password protected. Each preferences smart card can be unique for an associated end user of the client apparatus 106. Using a plurality of preferences smart cards, a plurality of individual preferences can be provided for a plurality of end users of the client apparatus 106.

A playlist smart card is a custom card for an individual. The playlist smart card is a collection and organization device for content available via the electronic network 100. The playlist smart card can be used to collect music, library content, events, or radio programming using personalized icons, event schedules, and playlists. Access to some content may be secured using the playlist smart card via a purchase. The playlist smart card can be traded, downloaded, sold, and/or bartered between two individuals. Typically, the playlist smart card is dedicated to a single function.

A promotions smart card provides privileged access to predetermined events, such as special events. For example, the promotions smart card can bring the end user to a specified location via the electronic network 100 to listen to programmed content. The promotions smart card can be purchased or received free of charge. Typically, the promotions smart card is dedicated for accessing a single function. It is preferred that the promotions smart card be the equivalent of a read-only playlist smart card.

A payment smart card provides a means for paying for content. The payment smart card can store billing information for content purchases absent of credit card information. The ability to purchase or rent content may allow the end user to gain access to new releases or obscure content.

The card organizer display includes a first portion 730 dedicated for preferences smart cards, a second portion 732 dedicated for playlist smart cards, and a third portion 734 dedicated for promotions smart cards. Only three portions are displayed because the payment smart card provides part of the preferences for the end user.

Each of the first portion 730, the second portion 732, and the third portion 734 includes one or more card icons (a respective one being indicated by reference numeral 736). Each of the card icons is user-selectable to select an associated smart card for further action. Each card icon can be selected using a point-and-click operation, or by using one of up scroll controls 740 and one of down scroll controls 742.

Upon clicking on or otherwise selecting a card icon such as the card icon 736, a step of displaying a cover and/or a description of the associated smart card is performed. To view the contents of the smart card, the associated card icon 736 is dragged and dropped to a fourth portion 750 of the display. The fourth portion 750 includes a graphical representation of a card slot 752.

FIG. 30 is an example portion of the interface displayed in response to the aforementioned drag-and-drop operation. For purposes of illustration and example, a preferences smart card associated with the card icon 736 was dragged and dropped to the fourth portion 750. In response to this operation, a graphical card 760 is displayed within the card slot, a textual name 762 of the smart card is displayed in an oblique font within a graphical tab 764, and the contents of the smart card are displayed over the first portion 730, the second portion 732, and the third portion 734 in FIG. 29.

The textual name 762 in the graphical tab 764 indicates which smart card is active. A function of the player being controlled by the smart card is also displayed in an oblique font. The textual name 762 includes up to fifteen characters of the smart card name. The smart card name can include up to two lines of text to describe the smart card. If the smart card name has more than fifteen characters, the first fifteen characters are displayed, followed by a series of dots.

The preferences smart card has three areas that can be viewed and/or edited. The three areas include an identity area, a defaults area, and a payment options area. A first graphical button 770 is dedicated to receive a user-initiated action to access the identity area. A second graphical button 772 is dedicated to receive a user-initiated action to access the defaults area. A third graphical button 774 is dedicated to receive a user-initiated action to access the payment options area.

As illustrated, FIG. 30 shows a display of the identity area. The identity area includes a plurality of fields to store

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identity information. The fields can include fields for login information, password information, name information, address information, city information, and an electronic mail address.

FIG. **31** shows a display of the defaults area initiated upon selecting the second graphical button **772**. The defaults area includes information on how to handle specific actions, such as whether to automatically play a selected title from the radio content category, the events content category, the library content category, and the music content category.

FIG. **32** shows a display of the payment options area initiated upon selecting the third graphical button **774**. The payment options area includes a shipping address and a billing address. The payment options area also provides an option **780** for the end user to type a credit card number in order to make a purchase. It is noted that the credit card number is not stored to the player.

With reference to each of FIGS. **29** to **32**, an edit button **790** can be selected to edit any of the information associated with the smart card. A cancel button **792** can be selected to cancel the edit. A save button **794** can be selected to save the edited fields. A warning message can be provided to prompt the end user to save edited fields upon an attempt to exit. The end user can reject the warning to cancel all editing activity with the smart card.

FIG. **33** is an example portion of the interface displayed in response to a drag-and-drop operation of a playlist smart card to the fourth portion **750**. A playlist **800** of a plurality of items is displayed in response to the drag-and-drop operation. The playlist **800** is specific to a predetermined content area. Items can be selected from the playlist **800** for automatic playback, or can be selected using the selector.

Items can be added and deleted from the playlist **800**. To add an item, the material is selected using the browser, followed by a selection of the save button **794**. Clicking on or otherwise selecting the save button **794** saves all qualifying radio stations, events, or titles to the playlist smart card. Although items can be added and deleted, contents of items within the playlist smart card are not user-editable.

FIG. **34** is an example portion of the interface displayed in response to a drag-and-drop operation of a promotions smart card to the fourth portion **750**. The promotions smart card is similar to a playlist smart card. However, items within the promotions smart card cannot be added, deleted, or edited. Items can be selected from the promotions smart card for automatic playback, or can be selected using the selector.

With reference to FIGS. **30** to **34**, a graphical button **810** can be selected to send smart card information in an electronic mail message. Virtual smart card information, stored as a file in the client apparatus **106**, is transmitted as a file in the electronic mail message. The electronic mail message can be communicated to another of the plurality of client apparatus **104** via the electronic network **100**. If there are unique privileges for the smart card, the smart card information can be deleted at the sending apparatus. Alternatively, communication of the smart card information can be inhibited if there are unique privileges.

A new smart card is created by selecting a graphical button **820** when no smart card is active. In response to receiving a selection of the graphical button **820**, a list of options is displayed. The options include an option to create a preferences smart card, an option to create a playlist smart card, and an option to obtain a smart card from an incoming electronic mail message. For a smart card created from an incoming electronic mail message, the type of smart card is dependent upon the type of smart card used to generate the electronic mail message.

By selecting the option to obtain the smart card from an electronic mail message, a directory of possible virtual cards is displayed. The end user can browse the directory to find and select a virtual smart card of interest.

Each of the smart card categories can have a limited number of smart cards. For example, each of the playlist category and the promotions category can be limited to ten smart cards, and the preferences category can be limited to five smart cards. If the limit has been attained, the graphical button **820** is displayed in a second color such as grey rather than black.

The contents of the active smart card can be deleted by selecting a graphical button **822**. A message confirming that the contents are to be deleted (such as "are you sure") is displayed prior to deleting the contents.

A graphical button such as an icon **824** can be user-selected to de-select the active smart card in the card slot. The icon **824** includes a graphical eject button. In response to a user-selection of the icon **824**, the graphical card **824** is removed from the fourth portion **824**, and the formerly active smart card is returned to its position. p A graphical button such as an icon **826** can be user-selected to return to the display of the card organizer. The icon **826** graphically resembles a file folder. It is noted that the active smart card remains active in response to selecting the icon **826**.

As described with reference to FIG. **1**, the player **142** can provide a second visual interface having a collapsed view. Preferably, in the collapsed view, the tabs for the lower portion of the window including the information control **220**, the search control **224**, the user feedback control **226**, and the smart card control **230** remain visible. A user-initiated selection of any of the controls **220**, **224**, **226**, and **230** directs the player to open the second display region **222**, and to initiate a feature associated therewith.

FIG. **35** is a screen shot of a first embodiment of the graphical user interface in the radio content mode. The default radio station indicated by the graphical marker **332** on the graphical radio dial **330** begins playing upon its selection.

As with the previously-described embodiments, the interface includes the categorical selection controls **244**, **245**, **246**, and **247**, the preset selection indicators **202**, the preset selection controls **204**, the advance/review controls **206**, the playback controls **210**, the volume controls **212**, the selection attribute indicators **214**, the streaming indicator **216**, the first display region **218**, the information control **220**, the second display region **222**, the search control **224**, the user feedback control **226**, the smart card control **230**, the help mode control **232**, the first logo **234**, the second logo **236**, the advertising window **240**, and the attractions window **242**. The user feedback control **226** provides access to chat features in this embodiment.

FIG. **36** is a screen shot showing a content selection interface in the first preferred embodiment. A window **850** opens upon clicking the select button **260** or any of the attributes that define the dial at the time.

FIG. **37** is a screen shot of a second preferred embodiment of the graphical user interface. The second preferred embodiment may be programmed in a markup language such as HTML, in comparison to the first preferred embodiment which may include plug-in-specific code to provide animation (such as Shockwave code).

A radio dial **870** spatially displays the band and location of all available stations that match selected criteria. A station

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pick list **872** allows for a user selection of all stations from the radio dial **870**. A banner **874** displays banner advertisements that rotate in accordance with a predetermined schedule. A region **876** displays logos and attractions that rotate in accordance with a predetermined schedule. A selection area **880** provides categorical selection controls and player function controls. A region **882** displays streamed and clickable text that can include attractions and advertisments. An information space **884** displays supplementary information about the current content, including schedules, links to other destinations and feedback. A control panel **886** indicates and controls play, pause, volume, and streaming status. A region **890** is dedicated for entering a keyword to perform a search for content using a single click. A region **892** is dedicated for display and management of presets with one set of presets per end user.

FIG. **38** is a screen shot of the second embodiment in a radio player mode. Upon receiving a user-initiated selection of a selection attribute (band, category, or location) in the selection area **880**, a pick list **894** of available options is populated from a database. To speed in the process of selecting material, the interface is absent of a submit button. Therefore, as soon as the end user releases a mouse button over an item in the pick list **894**, the item is selected.

FIG. **39** is a screen shot of the second embodiment in an events player mode. Radio buttons **896** indicate a current position within an event or another time-based selection relative to an entire length of time. Selecting events, spoken audio, and music is facilitated in the selection area **880**. Upon selecting a content category (either live events, spoken audio, or music collection), the end user is prompted to select two attributes to narrow or filter the content to list of manageable length.

It is noted that embodiments of the graphical user interface can change in a region-dependent manner (e.g. dependent upon the location of the client apparatus **106**). For example, the FM broadcast spectrum (which differs for different regions in the world) can depend upon the location of the client apparatus **106**. Further, textual information can be displayed in one of a plurality of languages in dependence upon the location of the client apparatus **106**.

It is also noted that alternative controls can be provided to control settings and parameters of the herein-described embodiments of graphical user interfaces. These graphical controls include, but are not limited to, graphical buttons, checkboxes, radio buttons, scroll bars, slider bars, pop-up menus, and dialog boxes. Further, alternative indicators can be provided to display information in embodiments of the graphical user interfaces.

Other options that can be included in embodiments of the present invention are as follows.

A physical login card can be sent to a new end user after each login creation. The physical login card can allow for advertisements that transcend the content (e.g. regularly scheduled programming or collections).

Prior to initiating playback or providing a login screen, a tip-of-the-day can be provided to promote features of the graphical user interface.

An event-of-the-day or a feature-of-the-day can be broadcast for display at the second display region **222**. In response to a click operation or another user-initiated action, other information can be displayed in the second display region **222**.

A station-of-the-day can be broadcast for display in a manner similar to the aforementioned feature-of-the-day. A list of featured stations based on sets rather than individual stations can be provided (e.g. a famous individual's favorite stations).

A music critic feature allows end users to comment on music and other content to create a collaborative filtering product.

A special preset such as a mystery preset of the day can be provided in the set of presets. This preset can be the first preset in the set, for example.

Presets can have expiration dates. For example, an events preset may expire after a predetermined expiration date.

An advertising slot machine can be provided. The advertising slot machine can be provided by a JAVA applet that rotates attractions as a slot machine in the advertising window **240**. The attractions can be rotated randomly. If three like advertisements align, the end user can win a prize.

A separate attractions window can be provided. In this case, the end user can click on an image associated with content to retrieve information for the content. An option to play or not to play the content is provided to the end user. The end user can make his/her decision to play or not to play based upon the information.

Alternative content can be transmitted in cases such as a blackout period or when there is a technical difficulty.

FIGS. **40**A and **40**B are flow charts of an embodiment of a method of providing the graphical user interface. As indicated by block **900**, steps of verifying that necessary components are installed at the client apparatus **106** and offering system choices to an end user are performed. As indicated by block **902**, a step of determining if a smart card (physical or virtual) identifying the end user is present at the client apparatus **106**.

If the end user is a recognized user (block **904**), then a step of entering a password (block **906**) or a step of entering a login and a password (block **910**) is performed. Thereafter, a main page of the graphical user interface is provided (block **912**). Upon completion of the player, an exit message is communicated (block **914**) to the client apparatus.

If the end user is an unrecognized user (block **916**), then a step of entering a login and a password (block **920**) is performed. Thereafter, a main page of the graphical user interface is provided (block **922**). Upon completion of the player, an exit message is communicated (block **924**) to the client apparatus.

If the end user has previously visited without logging in (block **926**), then either a step of creating a login and a password (block **930**) or a step of selecting a visiting mode (block **932**) is performed. If a login and a password are created (block **930**), a main page of the graphical user interface is provided (block **934**). Upon completion of the player, an exit message is communicated (block **936**) to the client apparatus.

If the visiting mode was selected (block **932**), a main page of the graphical user interface is provided (block **940**). Upon completion of the player, a first exit message is communicated (block **942**) to the client apparatus. The first exit message provides options to save or not to save preferences generated during a session of the player. If an option to save the preferences is selected (block **944**), steps of creating a login/password profile (block **946**) and returning to the main page (block **950**) are performed. Thereafter, upon completion of the player, a second exit message is communicated to the client apparatus (block **952**). If an option to not save the preferences is selected (block **954**), a second exit message is communicated to the client apparatus (block **956**).

If the end user is a first time user (block **960**), then a step of creating a login and a password (block **962**) and a step of providing a main page of the graphical user interface (block

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964) are performed. Upon completion of the player, an exit message is communicated (block 966) to the client apparatus 106.

If the end user is a first time user who selects a visiting mode (block 970), a main page of the graphical user interface is provided (block 972). Upon completion of the player, a first exit message is communicated (block 974) to the client apparatus. The first exit message provides options to save or not to save preferences generated during a session of the player. If an option to save the preferences is selected (block 976), steps of creating a login/password profile (block 980) and returning to the main page (block 982) are performed. Thereafter, upon completion of the player, a second exit message is communicated to the client apparatus (block 984). If an option to not save the preferences is selected (block 986), a second exit message is communicated to the client apparatus (block 990).

If an invalid login and/or password is received in any of the above-described steps of receiving a login and a password, a message is communicated to the client apparatus 106. The message can include a message such as "Invalid Login/Password" and/or "Please Try Again". Thereafter, a step of receiving another login and password can be performed.

If a blank text entry field is received, a message is communicated to the client apparatus 106. The message can include a message such as "Please fill in all text fields". Thereafter, a step of receiving subsequent textual data can be performed.

The step of creating a login provides a dialog to query for demographic and listening preference information from the end user. The end user enters information in response to the queries. Typically, the information is entered during an initial use of the player, such as upon an initial arrival at a Web site associated with the player. The initial arrival at the Web site can be initiated by the end user clicking on a banner advertisement or another hyperlink from another Web site.

The information is retrieved for each subsequent visit or use to uniquely identify the end user, and to tailor the graphical user interface and/or the playback performed thereby to the end user. Further, the information allows listening habits, such as radio stations and music tastes, to be tracked.

FIGS. 41 to 43 are block diagrams summarizing a site map for an embodiment of the graphical user interface. The site map illustrates potential user-selectable flow paths between different features of the graphical user interface.

The end user can select between a high bandwidth interface (block 1010) and a low bandwidth interface (block 1012) for the audio player. For example, the high bandwidth interface may include code specific for an animation plug-in, such as Shockwave, whereas the low bandwidth interface may include only HTML code. Thereafter, a main page of the interface is provided in accordance with the user-selected bandwidth.

From the main page, the end user can navigate to a radio content feature (block 1014), an events content feature (block 1016), a library content feature (block 1020), a music content feature (block 1022), a rating room (or listening booth) feature (block 1024), a preferences feature (block 1026), a features feature (block 1030), a search feature (block 1032), and a contact feature (block 1034).

Using the radio content feature (block 1014), a radio station can be selected (block 1040), station information can be obtained (block 1042), and a radio preset can be selected (block 1044). Thereafter, a link to related Web site can be provided (block 1050), a list of station programs can be provided (block 1052), and station feedback can be received (block 1054).

Using the event content feature (block 1016), an event can be selected (block 1060), event information can be obtained (block 1062), and an event preset can be selected (block 1064). Thereafter, a link to related Web site can be provided (block 1070), an event schedule can be provided (block 1072), and event feedback can be received (block 1074).

Using the library content feature (block 1020), library content can be selected (block 1080), library content information can be obtained (block 1082), and a library content preset can be selected (block 1084). Thereafter, a link to related Web site can be provided (block 1090) and content feedback can be received (block 1094).

Using the music content feature (block 1022), music content can be selected (block 1100), music content information can be obtained (block 1102), and a music content preset can be selected (block 1104). Thereafter, a link to related Web site can be provided (block 1110) and content feedback can be received (block 1114).

Using the rating room feature (block 1024), a welcome message and a registration process is provided (block 1120). Once the end user is registered, an overview of the rating room feature can be displayed (block 1130), an album can be selected in dependence upon a user-selected genre (block 1132), the album can be rated by the end user (block 1134), the information associated with the album can be displayed (block 1136), and an exit message can be displayed (block 1140) upon exiting the rating room feature. Further, a status of the end user's cumulative rating points can be displayed (block 1142), points can be redeemed (block 1144), a list of albums to receive in return for the points can be displayed (block 1146), an album from the list can be selected (block 1150), and an exit message can be displayed (block 1152).

Using the preferences feature (block 1026), presets can be managed (block 1160), and a profile can be displayed and edited (block 1162).

FIG. 44 is a flow chart summarizing steps performed in an embodiment of a method of playing first audio content using a computer. As indicated by block 1200, a step of displaying a graphical radio dial indicating the first audio content is performed. As described earlier, the graphical radio dial can include an alphabetical scale and a graphical pointer. In this case, the graphical pointer can be positioned with respect to the alphabetic scale based upon text identifying the first audio content. Alternatively, the graphical radio dial can indicate an over-the-air frequency associated with the first audio content. In this case, the graphical radio dial can include a numerical scale and a graphical pointer, wherein the graphical pointer is positioned with respect to the numerical scale based upon the over-the-air frequency.

Optionally, the method includes a step of receiving a user-initiated selection of the first audio content from a plurality of audio content using the graphical radio dial (as indicated by block 1202). The step of receiving the user-initiated selection can include receiving a user-initiated action to navigate to the first audio content from second audio content adjacently indicated by the graphical radio dial.

As described earlier, the graphical radio dial can include a plurality of marks associated with a plurality of audio content having at least one attribute. For broadcasts, the at least one attribute includes at least two of a category attribute, a band attribute, and a location attribute. The band attribute can indicate one of an AM band, an FM band, and

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an Internet band for broadcasts. Optionally, a step (block **1204**) of receiving a user-initiated selection of a preset associated with the at least one attribute is performed.

The plurality of marks includes a first mark associated with the first audio content. In this case, the step of receiving the user-initiated selection of the first audio content can comprise steps of receiving the at least one attribute, determining the plurality of audio content based upon the at least one attribute, and receiving a user-initiated selection of the first mark.

As indicated by block **1206**, a step of receiving data via an electronic network is performed. The data encodes the first audio content. If the data includes streamed data received via the Internet, the method further comprises the step of decoding the streamed data, as indicated by block **1210**. As indicated by block **1212**, a step of playing the first audio content is performed.

FIG **45** is a flow chart summarizing steps in an embodiment of a method of obtaining user feedback to music content. As indicated by block **1240**, a step of receiving a category of music content selected by an end user is performed. Optionally, a step of displaying a plurality of categories of music content is performed (block **1242**) prior to the step indicated by block **1240**. In this case, the category of music content is selected by the end user from the plurality of categories. As another option, a step of determining the plurality of categories based upon a listening behavior of the end user is performed. A further option is to have the plurality of categories be dependent upon at least one preference of the end user.

As indicated by block **1244**, a step of communicating at least a portion of a music item within the category to the end user is performed. The music item is selected within the category independent of the end user. If the music item includes an album including a plurality of songs, the step of communicating at least a portion of the music item can include communicating limited duration samples of the plurality of songs.

As indicated by block **1246**, a step of receiving a rating of the music item by the end user is performed. As indicated by block **1250**, a step of accounting for the rating of the music item by the end user is performed. The step of accounting for the rating of the music item can include maintaining a count of music items rated by the end user. In this case, the method can further comprise the step of determining if the count attains a threshold. This step is performed to determine if the end user has qualified for a complimentary copy of music.

Optionally, a step of displaying a list of a plurality of music items previously rated by the end user is performed (block **1254**). The list can include the music item whose rating was received in block **1246**. Steps of receiving a user-initiated selection of the music item from the list (block **1256**), displaying the rating for the music item (block **1260**), and replaying at least a portion of the music item (block **1262**) may be performed also.

FIG **46** is a flow chart summarizing steps in an embodiment of a method of assisting operation of an audio content player. As indicated by block **1270**, the method includes a step of displaying a plurality of icons including at least one icon associated with user information and at least one icon associated with playlist information. Optionally, the plurality of icons includes at least one icon associated with privileged access to audio content.

As indicated by block **1272**, a step of receiving a user-initiated selection of a first icon from the plurality of icons is performed. The first icon can be associated with at least one of an actual smart card and a virtual smart card. The step of receiving the user-initiated selection can include receiving a user-initiated drag action of the first icon to a portion of a display. In this case, steps of displaying a graphical card slot at the portion of the display (block **1274**) and displaying a graphical card within the graphical card slot in response to the user-initiated drag action (block **1276**) can be performed.

As indicated by block **1280**, the method includes a step of operating the audio content player in dependence upon first information associated with the first icon. If the first icon is associated with privileged access to audio content, the step of operating the audio content player can include providing privileged access to audio content. If the first icon is associated with playlist information, the step of operating the audio content player can include playing at least a portion of a playlist.

Optionally, the method further comprises the step of modifying the first information associated with the first icon (step **1282**). In this case, the audio content player is operated in dependence upon modified first information in block **1280**. If the first icon is associated with user information, the step of modifying the first information can include modifying user identity information, modifying a default for automatic playback, or modifying a payment option. If the first icon is associated with playlist information, the step of modifying the first information can include adding an item to a playlist or deleting an item from a playlist.

It is noted that the herein-described methods can performed by a computer (which may be included with the client apparatus **106** and/or the server **102**). Further, the computer can be directed to perform the herein-described methods by computer-readable data stored by a computer-readable storage medium.

FIG. **47** is a screen shot of a third embodiment of the graphical user interface. A radio dial **1300** spatially displays the band and location of all available stations that match selected criteria. A station pick list **1302** allows for a user selection of any of the stations from the radio dial **1300**. A banner advertising region **1304** displays banner advertisements that rotate in accordance with a predetermined schedule. An attractions region **1306** displays logos and attractions that rotate in accordance with a predetermined schedule. A selection area **1310** provides categorical selection controls and player function controls. A region **1312** displays streamed and clickable text that can include attractions and advertisements.

An information space **1314** displays supplementary information about the current content, including schedules, links to other destinations and feedback. In general, any visual content can be combined with the audio content for display in the information space **1314**. Preferably, the information space **1314** provides a title of the audio content being played (e.g. the title "Shepherd of the Night Flock" of a song being played by the radio station WBEZ), a title and an image of an album containing the audio content (e.g. the album title "Blue Nance"), a name of an artist associated with the audio content (e.g. the name of the performer of the song: "The Junior Mance Trio"), and a name and a logo of an entity associated with the audio content (e.g. a copyright notice for Chiaroscuro Records which is the label for the song, and its logo).

A user-initiated selection of the title of either the album or the image of the album can initiate a display of information associated with the album (e.g. liner notes, performance credits, and other information) and/or a playback of audio samples from the album. A user-initiated selection of the

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name of the artist can initiate a display of information associated with the artist. A user-initiated selection of either the name of the entity or the entity logo can initiate a display of information associated with the entity (e.g. information of other albums and audio content provided by the entity). Each of the aforementioned information can be provided either by the server **102** or by hyperlinking to other destinations of the electronic network **100** (e.g. Web pages for the album, artist, and entity).

It is also preferred that the information space **1314** includes an option to buy the audio content being played (e.g. the option "buy now"), an option to display a program guide for the radio station playing the audio content (e.g. the option "program guide" to display information for WBEZ), and an option to provide user feedback (e.g. the option "user feedback").

A control panel **1316** indicates and controls play, pause, volume, and streaming status. A region **1320** is dedicated for entering a keyword to perform a search for content using a single click.

A region **1322** is dedicated for display and management of presets with one set of presets per end user. The region **1322** provides an option to create a new login, i.e. to create a new end user preferences and profile. The region **1322** further provides an option to load preferences associated with an end user.

FIG. **48** is an example of a first display in an embodiment of a listening booth or rating room feature. The rating room feature can be activated in response to receiving a user-initiated selection of the user feedback control **226** or another link thereto. The link can include information indicating an amount of audio items (e.g. music items) to rate and an amount of rating time which are to be satisfied to receive complimentary music. For example, textual information such as "you have 15 days left to rate 6 more CD's in order to choose one free" can be associated with the link.

Preferably, the link is provided in a main graphical page provided by the player. In this case, if the end user sets his/her browser program to an electronic address associated with the player, the main page is displayed upon initiation of the browser program. Additionally, as the main page downloads to the end user, the personal profile of the end user created at an initial login is retrieved. The personal profile uniquely identifies the end user as he/she navigates through the player.

The display includes an option **1330** to display rules and regulations for receiving a complimentary item, such as a complimentary music item. The option **1330** can include, for example, textual information indicating a portion of the rules and regulations such as "Rate 10 CDs and Choose 1 Free".

The display includes an option **1332** to review which audio items have been previously rated by the end user. The option **1332** can include textual information indicating a number of music items previously rated by the end user. For example, the textual information can include "4 albums rated towards free CD". Alternatively, the option **1332** can include textual information indicating a remaining number of items to rate before receiving a complimentary item such as a complimentary music item.

The display includes a plurality of options **1334** for categories or genres of music content. For example, the categories can include jazz, classical, alternative rock, country and latin. It is noted that other categories of music content may be displayed in addition to or as alternatives to the aforementioned categories. The categories can be dependent upon the personal profile or preferences of the end user collected when the user profile is created. Alternatively, the categories can be dependent upon the end user's listening behavior using the player. In this case, the categories are selected to best represent the current listening habits of the end user.

An artist name, a title, and a cover art image of an item, such as an album, are displayed for each category. Preferably, the end user does not influence which item is displayed for the category.

FIG. **49** is an example of a second display for reviewing rated items in a preferred embodiment of a listening booth or rating room feature. The second display is provided in response to receiving a user-initiated selection of the option **1332** to review which items have been previously rated by the end user. The second display includes a plurality of item regions. The number of item regions corresponds to a total number of items which must be rated in order to receive a complimentary item. For example, ten item regions corresponding to ten total audio items to rate to receive a complimentary item are illustrated in FIG. **49**.

Information associated with each previously-rated item is displayed in a corresponding item region (a representative one indicated by reference numeral **1340**). The information can include an artist, a title, an image such as an album cover, and a category for the item. For example, four of the ten item regions have information displayed to identify four previously-rated items for the end user. Each item region corresponding to a previously-rated item includes a user-selectable portion. In response to receiving a user-initiated selection of the portion (such as the album cover), additional information associated with the item is displayed. The additional information can include a complete media file including a complete track list with rating scores for the songs rated, promotional information, liner notes, lyrics, and credits.

Remaining ones of the item regions (a representative one indicated by reference numeral **1342**) can be user selected to return to the main selection page (such as in FIG. **48**). Rather than item information, the remaining ones of the item regions can have textual information indicating a portion of the rules and regulations such as "rate 10 CDs choose 1 free". For example, six item regions corresponding to six more music items to be rated before receiving the complimentary item are absent of item information in FIG. **49**.

FIG. **50** is an example of a third display for rating an item in an embodiment of a listening booth or rating room feature. The third display is provided in response to receiving a user-initiated selection of one of the options associated with categories of music content. For purposes of illustration and example, a user-initiated selection of the option associated with the jazz category in FIG. **48** is considered.

The third display includes information associated with the item to be rated. The information includes the artist (e.g. Earl Hines), the title (e.g. *In New Orleans*), the cover art image, and a label (e.g. Chiaroscuro) for the item. The cover art image is displayed over a larger display region than the cover art image in FIG. **48**.

The third display includes a list of a plurality of tracks from the item to be rated. For example, the list can include four tracks (i.e. songs) from the *In New Orleans* album. The end user is required to rate each of the tracks in order to obtain credit for rating the album. It is noted that the album may include additional tracks which need not be rated by the end user.

Each track is identified by textual information such as a title **1350** in the list. Also associated with each track is an

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icon **1352** indicating whether the track has been previously rated by the end user. The icon **1352** includes a question mark to indicate that the track is unrated by the end user. If the track has been previously rated, an indication of the rating is displayed in the icon **1352**.

The end user selects either a title from the list or its associated icon to commence a rating process for an associated track. In response to receiving a user-initiated selection of a title or an icon, at least a portion of the associated track is communicated to the client apparatus **106**. Although an entire portion of the associated track can be communicated, it is preferred that a limited-duration sample of the associated track be communicated. For example, the limited-duration sample can be comprised of a 30-second clip of the associated track.

Preferably, the portion of the associated track is communicated to the client apparatus **106** using streaming technology. The client apparatus **106**, in turn, plays back the portion of the associated track for the end user.

A graphical rating tool is displayed either during playback or upon completing playback of the portion of the associated track. The graphical rating tool is used to receive at least one rating for the track. The graphical rating tool can be displayed either in place of the icon **1352** or proximate to the icon **1352**.

The third display includes an option **1354** to buy the item. In response to receiving a user-initiated selection of the option **1354**, the item is tagged for purchase. Further, the item can be placed in a virtual shopping cart that stores all items tagged for purchase. Thereafter, a check-out option is provided to finalize the purchase of tagged items. A check-out reminder can be automatically initiated if the end user exits from the player while items are tagged for purchase. The check-out reminder can include a visual message or an audible message displayed by the client apparatus **106**.

The third display includes an option **1356** to cancel a rating of the current item. In response to receiving a user-initiated selection of the option **1356**, the user interface returns to the main selection page (such as in FIG. **48**) where the end user can select another item to rate.

FIG. **51** is a view of an embodiment of the graphical rating tool. The graphical rating tool includes a plurality of rating options **1360**. Preferably, each of the rating options **1360** has the form of a hot region associated with a rating. For example, the rating options can include five hot regions for receiving ratings from one to five.

During playback of the track, the end user varies a position of a cursor **1362** over the rating options to indicate his/her dislike or like of the track. For example, the end user may position the cursor **1362** over the hot region for a one-rating during portions of the track he/she dislikes, and may position the cursor **1362** over the hot region for a five-rating during portions of the track he/she likes. Preferably, a display graphic within the hot region is modified in response to the cursor **1362** being positioned thereon. For example, the display graphic can appear to illuminate (e.g. to light up) in response to the cursor **1362** being position on the hot region.

A plurality of ratings generated over time are recorded by the client apparatus **104** and/or the server **102**. The time sequence of the plurality of ratings can be formed by repeatedly sampling the rating for either equal or unequal time intervals.

When the end user has formulated an overall rating or a score for the item as a whole, he/she points to and clicks on a particular rating option. An indication of the overall rating is recorded and displayed. Preferably, the overall rating is displayed within the icon **1352** associated with the track. The title **1350** and the icon **1352** for rated tracks are displayed in a second color which differs from a first color used to display titles and icons for unrated tracks.

FIG. **52** is an example of a modified third display, in an embodiment of a listening booth or rating room feature, once all of the tracks for an item have been rated. The modified third display includes indications of the overall ratings for the tracks. The third display is modified to include an option **1370** to submit the ratings. Before submitting the rating scores, the end user is provided an opportunity to re-rate any of the tracks by selecting (e.g. pointing to and clicking on) either its associated title or its rating score icon.

FIG. **53** is an example of the second display, in an embodiment of a listening booth or rating room feature, updated based upon a submission of ratings for the item. Information associated with the item is displayed in a corresponding item region **1380**. The information can include an artist, a title, an image such as an album cover, and a category for the item. Hence, five of the ten item regions have information displayed to identify five previously-rated items. As described with reference to FIG. **49**, remaining ones of the item regions can be user selected to return to the main selection page. However, the category or genre of music associated with the item is removed from the main selection page. The category or genre can be removed until a predetermined number of users have provided ratings therefor. For example, the category or genre can be removed until ratings have been received from at least hundred other end users or more.

Also as described with reference to FIG. **49**, a user-initiated selection of the image, such as the album cover, initiates a display of additional information associated with the item. An example of the display of additional information is depicted in FIG. **54**.

FIG. **54** is an example of a fourth display in an embodiment of a listening booth or rating room feature. The fourth display is displayed in response to receiving a user-initiated input such as a selection of an album cover image.

The fourth display includes a banner region **1390**, a cover art region **1392**, a controls region **1394**, and an information region **1396**. The banner region **1390** includes a service icon, textual information indicating the category or genre of the item (e.g. "Jazz"), and an option **1400** to return back to the category selection page. The option **1400** can include textual information indicating a number of music items previously rated by the end user. For example, the textual information can include "5 albums rated towards free CD". Alternatively, the option **1400** can include textual information indicating a remaining number of items to rate before receiving a complimentary item such as a complimentary music item.

The cover art region **1392** includes information identifying the item. The information includes the artist (e.g. Earl Hines), the title (e.g. *In New Orleans*), the cover art image, and the label (e.g. Chiaroscuro) for the item. In response to a user-initiated selection of a portion of the cover art region **1392** (such as the album cover), a larger, higher-resolution image of the cover art is displayed. This allows the end user to print a hard copy of the cover art for the item.

The information region **1396** is used to display information associated with the item. The information can include a track list with rating scores for rated songs, promotional information, liner notes, lyrics and credits. Preferably, all of the aforementioned information is included in a single media file for the item. This allows the end user to print all of the information at once.

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The portion of the information displayed in the information region **1396** is controlled by either a scroll bar **1402** or by controls in the control region **1394**. The control region **1394** includes a first control **1404** to initiate a display of the track list, a second control **1406** to initiate a display of promotional information, a third control **1410** to initiate a display of the liner notes, a fourth control **1412** to initiate a display of the lyrics, and a fifth control **1414** to initiate a display of the credits. Each of the aforementioned controls in the control region **1394** is used to jump to a targeted portion of the single media file. The control region **1394** further includes a sixth control **1410** to initiate a purchase of the item (e.g. the option "Buy CD").

Optionally, the album rating page described with reference to FIG. **50** can include an option to provide additional feedback for the item. The option can have the form of a button or control including text such as "tell us more". In response to a user-initiated selection of the option, a detailed rating criteria interface is provided. An example of this interface is depicted in FIG. **55**.

Further, the category or genre selection interface described with reference to FIG. **48** can include an option to provide a comparative rating for a plurality of items. The option can have the form of a button or a control. In response to a user-initiated selection of the option, a comparative ranking interface is provided. An example of this interface is depicted in FIG. **56**. The comparative ranking interface is advantageous in providing record labels additional feedback for albums such as albums that were successful during their initial rating and albums which receive a marketing push.

FIG. **55** is an example of a fifth display in an embodiment of a listening booth or rating room feature. The fifth display includes a plurality of rating criteria. The rating criteria can be encoded by information associated with the track or song. In this way, each track or song can have its own set of rating criteria. Preferably, an entity such as a record label indicates which rating criteria are to be provided for one of its songs. The entity can select the rating criteria from a checklist of all potential rating criteria.

For purposes of illustration and example, the fifth display provides a graphical interface **1420** to receive and display a vocals rating, a rhythm rating, a brass rating, and a danceability rating from the end user. Each rating is entered using an associated up control and/or an associated down control. Each rating can be numerical, such as integers from one to ten. Each rating is displayed both textually and by a graphical bar chart display.

The fifth display further provides an option **1422** to include additional criteria. In response to a user initiated selection of the option **1422**, a list of all potential rating criteria can be displayed. The end user can select a rating criterion from the list and can enter a rating therefor.

The fifth display further provides an interface **1424** for entering user comments. The interface **1424** can include a text box to allow the end user to enter comments in the form of a textual message.

To submit the additional feedback, the end user selects an option **1426** provided by the fifth display. The option **1426** can include a graphical button having text such as "submit ratings". In response to receiving the user-initiated selection of the option **1426**, the additional feedback is recorded by the server **102**.

FIG. **56** is an example of a sixth display in an embodiment of a listening booth or rating room feature. The sixth display provides a graphical interface to receive a comparative ranking of a plurality of items. The plurality of items are typically selected by an entity such as a record label, and not by the end user. The plurality of items may or may not be within a genre or a category of music.

The sixth display includes a plurality of images, such as a plurality of album cover images, associated with the plurality of items. Each image is user-selectable, such as by a point-and-click operation, to initiate playback of audio samples for its associated item. If available, ratings and comments previously submitted by the end user are also displayed in response to the aforementioned user selection.

The sixth display further includes a plurality of display locations for comparatively ranking the plurality of items. Each of the plurality of display locations is responsive to a drag-and-drop operation of one of the plurality of images. For example, an end user can click on a first image **1440**, drag the first image **1440** to a first display location **1442**, and drop the first image **1440** at the first display location **1442** to indicate that the item associated with the first image **1440** is his/her favorite from the plurality of items. Similarly, the end user can click on a second image **1444**, drag the second image **1444** to a second display location **1446**, and drop the second image **1444** at the second display location **1446** to indicate that the item associated with the second image **1444** is his/her next favorite from the plurality of items. Once the end user has entered a comparative ranking of the items, the comparative ranking is submitted to the server **102**.

Based upon any of the user-generated rating information and comments described herein, the music testing component **152** in FIG. **1** generates and provides reports including the actual data and/or summaries thereof. Each report can be specific to one or more songs associated with an entity such as a record company. The report is communicated to the entity to provide rating information and comments for its music items. The report can be stratified by demographics such as gender, age, occupation, and geographical region of the end users. Each report can be automatically generated either at periodic or predetermined times, or after a predetermined number of end users have rated an item, or upon receiving a request. For example, a report for an item can be automatically generated and communicated to the entity via the electronic network **100** after one hundred end users have rated the item. As another example, a report for an item can be communicated to an entity in response to a request received from the entity via the electronic network **100**.

In a particular embodiment, the music testing component **152** and the promotions component **156** function as follows. To initiate music testing, a client supplies an album to be tested (either on CD or another medium), indicates which four tracks are to be tested, identifies a 30-second clip from each track, and provides additional testing information. If desired, this initiation process can be performed on-line via the electronic network **100**.

Typically, the client is associated with a promoter of the album such as a record label for the album. Preferably, the client also supplies additional copies of the album for end users who redeem their credits to obtain the album. The additional copies of the album can be supplied by a fulfillment house indicated by the client. The number of additional copies is based upon a required batch size.

The 30-second clips are digitally encoded for streaming, and made available to the server **102**. An entry for the music test is made in a database (herein referred to as MusicTestingBatch). The entry (herein referred to as Batch) includes a Universal Product Code (UPC) for the album, a scheduled start date for testing, either a scheduled end date for testing or a scheduled number of testing days, a required

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number of responses (batch size), a genre of the album, and descriptive information such as liner notes. credits, and lyrics. The entry is assigned a unique identification code (herein referred to as BatchID). The database includes a client identification code (herein referred to as ClientID) used for billing and report generation purposes. Optionally, data indicating a total number of songs submitted by the client is updated based upon the entry.

Each entry in MusicTestingBatch is assigned a queue position for its genre. To readily identify which album an end user will rate, a batch queue cache stores an active queue position identifier and an associated BatchID for each genre.

The database includes data (herein referred to as BatchResponse) that identifies all of the end users (by their CustomerIDs) that have rated a particular album (using its BatchID). Using this data, a check is performed to ensure that the end user has not previously completed rating of the album identified by the batch queue cache. Alternatively, the check can be performed using data stored in the user profile. In this case, the user profile includes an AlbumID for each album rated by the end user.

If the end user has previously completed rating the album, the queue position is incremented to a subsequent position. The queue position is repeatedly incremented until a previously-unrated album is identified. If all albums in the genre were rated by the end user, a message suggesting that the end user choose another genre is communicated to and displayed by the client apparatus **106**.

Once the end user has listened to and scored all of the song samples within the batch, the music testing component **152** registers the response and increments the queue position. To register the response, the music testing component **152** stores the scores in a MusicTestingResponse table and a MusicTestingScore table by CustomerID and BatchID. The MusicTestingScore table tracks user ratings by correlating BatchID, SongID. and CustomerID. Optionally. the AlbumID is stored in the user profile to prevent the album from being rated more than once by the end user. If the end user has not scored all of the samples, no information is stored for the end user.

It is noted that separate MusicTestingResponse and MusicTestingScore tables may not be necessary since the difference between these two tables is that MusicTestingScore has an additional entry per song.

In addition to an entry being made in the MusicTestingResponse table, the customer profile of the end user can be modified based upon the test. If the end user is enabled to receive promotions (e.g. by having a preferred customer profile), the music testing component **152** credits his/her account upon completing the rating. If the end user is unable to receive promotions (e.g. by having a lesser status such as basic customer or guest), no credit is provided to the end user's account. Optionally, each credit has an expiration date after which the credit is purged.

Preferably, a promotions-enabled customer profile maintains a number of testing credits (herein referred to as NumMusicTestingCredits) and a promotion enable date (herein referred to as PromotionEnableDate). The presence of a PromotionEnableDate greater than the current date indicates that the end user has already received a promotional item, and will not receive credit for the test. If the PromotionEnableDate is not present (e.g. if the end user has not received a promotional item) or if the PromotionEnableDate is less than the current date, then the end user is eligible to receive credit for the test. In this case, the number of testing credits is incremented upon performing the test. Additionally in this case, an entry is made in a promotions database (herein referred to as PromotionResponseAlbumsPresented). The entry includes the BatchID, the CustomerID, and a false value is assigned to a flag (herein referred to as PromoUsedFlag). The entry indicates that the end user has tested the item and that the item can be used for a promotion.

If the accumulated number of testing credits for the end user attains a threshold, a promotional item such as a CD is offered to the end user. The end user is allowed to select the promotional item from a plurality of promotional items having a false PromoUsedFlag in the promotions database. It is noted that each promotional item can have a limited duration of availability based upon its scheduled end date.

The promotions component **156** receives a response (accept or reject) from the end user. If the end user accepts an item, the following steps are performed. A flag (herein referred to as SelectedFlag) associated with the item is set to true in the promotions database. Information in the customer profile needed to distribute the item to the end user (e.g. a name and a shipping address or an electronic mail address) is forwarded to the fulfillment house. Using the information, the fulfillment house can deliver a physical copy of the item or can deliver an electronic copy of the item via the electronic network **100**. The number of testing credits is reset to zero. The PromotionEnableDate is set to a date equal to a predetermined time duration beyond the current date. As a result, the end user can continue rating items after the accumulated number of credits has attained the threshold, however, credit accumulation for the end user is inhibited for the predetermined time duration. The PromoUsedFlag is set to true for all entries associated with the CustomerID of the end user in PromotionResponseAlbumsPresented. This step assures that the same albums are not presented to the end user in a subsequent promotion.

If the end user rejects receiving an item (e.g. by not selecting an item from a list of available items), the following steps are performed. The number of testing credits is reset to zero. The PromoUsedFlag is set to true for all entries associated with the CustomerID of the end user in PromotionResponseAlbumsPresented. As a result, the end user has forfeited his/her credits, and may not select from these items in a subsequent promotion. However, the PromotionEnableDate is maintained so that the end user's ability to acquire credits is not affected.

After a promotion transaction is completed (either by accepting or rejecting the item), records associated therewith are migrated from the promotions database into an archive database.

Optionally, a notification message can be occasionally sent to the end user via the electronic network **100** to the end user of his/her credit status.

Once a batch has attained the required number of responses, the end date for testing is set to the current date, and a batch complete flag is set to a logical true. It is noted that the number of responses can be allowed to slightly exceed the required number of responses in this case. During nightly processing, the batch response data is summarized and packaged into a report. The report provides demographic data on the respondents and provides a measure to compare results across albums within a genre for a specific client. The client can be a record label that submitted the test request or a radio station seeking well-rated music.

The report can include: the BatchID; a report date and time; the scheduled start and end times; the actual start and end times; the MusicID for the album, the title of the album;

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the first and last name of the primary artist for the album, the SongID, title, artist, and publisher of each tested song from the album; a count of the number of testing responses for the album, a hit index providing a count of responses which rate each song as least/highest, an average music testing score for each song and for the batch; a bar graph showing a percentage of responses at each score; and listener demographics. The report can also indicate a number of promotions that were accepted and a number that were declined, a promotion completion time, and a comparison of respondent ratings of redeemed albums versus non-redeemed albums.

Either the report or a notification thereof can be delivered to the client via the electronic network **100**. For example, the music testing component **152** can initiate that an electronic mail message be sent to the client after one hundred persons have rated songs from an album. The client, in turn, navigates to a Web site having the report in a marking language format such as HTML. The client can review the report using a browser program. The music testing component **152** generates a bill for providing the testing service for the client.

As an alternative to generating a report after receiving a predetermined number of ratings, the report can be generated after a predetermined time duration. Once the predetermined time duration has elapsed, the music testing component **143** generates a report summarizing as much information that was gathered. If a client wants to receive ratings within a shortened time period, the queue can be adjusted to make the album more likely to be presented to an end user than other albums in its genre or category. If desired, the queue can be adjusted to present the album to all end users which select its genre or category.

It is noted that as an alternative to testing a batch of songs from a single album, a batch can comprise songs from a plurality of albums. In this case, it is preferred that the songs in a batch have some relationship with one another. It is also preferred that each song being tested be included in only one batch.

Preferably, the music genre or category is associated with an entire album. For compilations and other multiple-format albums, a multi-genre category can be provided.

The music testing component **152** frequently checks tables in the database to ensure that null pointers do not exist. For example, a tested album may still reside in the database after its associated audio files have been removed and/or archived.

FIG. **57** is a block diagram summarizing a site map for an embodiment of the listening booth or rating room feature. The site map identifies functions available to the end user at specific points throughout the graphical interface. Upon entering the rating room feature, a main interface page is provided (block **1500**) wherein a step of checking for installed components is performed. The main interface page provides a feature to check the status of the end user (block **1502**), a feature to choose an album to rate by genre (block **1504**), an optional feature to reshuffle album choices (block **1506**), and a feature to display an overview and help information (block **1510**).

From the feature to check the status of the end user (block **1502**), the end user can choose to fulfill an option to receive a complimentary music item in return for rating a number of items in a time duration (block **1512**). A confirmation message for this option is provided in block **1514**.

Further from the feature to check the status of the end user (block **1502**), the end user can review previously-rated albums (block **1516**). In this path, a feature to view album information is provided (block **1520**). From this feature, features to view song titles (block **1522**), to view liner notes (block **1524**), to review rated songs (block **1526**), and to buy a CD (block **1530**) are provided.

The feature to choose an album to rate by genre (block **1504**) provides a feature to view album information (block **1532**), a feature to choose a song title to rate (block **1534**), and a feature to buy a CD (block **1536**). The feature to choose the song title to rate (block **1534**) provides a feature to rate a song (block **1540**), a feature to view liner notes (block **1542**), and a feature to buy a CD (block **1544**). The feature to rate the song (block **1540**) provides a feature to submit a ratings for the album (block **1546**).

FIG. **58** is a block diagram of an embodiment of a content entry subsystem **1600**. The content entry subsystem **1600** is described with reference to elements of FIG. **1**.

The content entry subsystem **1600** is used to acquire, convert, and/or update content stored by the storage device **116**. In general, content is acquired, converted, or updated by either (i) importing the content from an external source such as the server **144**, or (ii) entering the content using an administrative interface **1602**. The content entry subsystem **1600** addresses these two approaches of maintaining and populating the storage device **116** with content.

The content entry subsystem **1600** includes a content converter **1604** to convert the content from a first format associated with the server **144** to a second format associated with the server **102**. The content converter **604** can include one or more rules, and/or one or more filters to convert data from the server **144** to data which conforms to system requirements for the server **102**. Similarly, the administrative interface **1602** performs a step of verifying that manually-entered data conforms to the system requirements.

Preferably, the content entry subsystem **1600** periodically imports content data from the server **144**. For example, the content entry subsystem **1600** can be programmed to import content data from the server **144** on a nightly basis. The content data can have the form of a table retrieved from a Web page provided by the server **144**. The Web page is updated periodically (e.g. nightly) for this purpose. The content entry subsystem **1600** retrieves a content data file through HTTP, and stores a copy of the file with delimited field separators. If the Web page is password protected, the content entry subsystem can automatically provide a password to gain access thereto.

Once retrieved, the content data is converted or otherwise scrubbed to the second format. The content data in the second format is stored by a staging database **1606**. Preferably, the staging database **1606** substantially replicates the information stored in the server **144**.

The content entry subsystem **1600** assists in updating the database **148** using the converted data in the staging database **1606**. In general, the content entry subsystem **1600** updates the database **148** based upon the most recent changes in the staging database **1606**. The content entry subsystem **1600** compares the converted data to existing, active data in the database **148**. Rules are generated to convert the newest data to the active data. Caution is exercised to prevent changes that involve row deletes and key updates. The rules and exceptions can be dynamically generated to interpret changes in the server **144**.

The difference between the converted data and the active data is formatted to become an entry (update/add/delete) for the staging database **1606**. The data is made active upon satisfying an integrity check.

Daily changes to the database **1606** are logged. The changes can be summarized in a nightly administrative

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report generated by the content entry subsystem **1600**. A daily report of the data import process can be communicated by electronic mail or other means to system administrators. The logs of updates can be formed using transaction logs from a database software package such as SQL.

After one or more databases, including the database **148**, are updated by the staging database **1606**, the data in the staging database **1606** is backed-up by a data backup and recovery system **1610**, and purged. The data backup and recovery process **1610** makes available the most recent copy of the staging database **1606**.

Manually-entered data received by the administrative interface **1602** can include media location and other information used throughout the system. The media location can be in the form of an electronic address, such as a URL or a Uniform Resource Name (URN), for accessing the content via the electronic network **100**. Some information attributes may be considered optional. The content entry subsystem **1600** accepts a new entry without requiring the optional information attributes. The content entry subsystem **1600** verifies the information attributes. An encoded music file associated with the media location is made available upon verification.

Two examples of data formats from the server **144** include a broadcast format and a content format. TABLE I shows radio station data extracted from the broadcast format to generate data in the second format. TABLE II shows music data extracted from the broadcast format to generate data in the second format. TABLES III to VII show song data extracted from the Liquid Audio format to generate data in the second format.

The station ID parameter is a code to uniquely identify each radio station. Preferably, the station ID is not relied upon for identifying the station. The Call Letters parameter provides the call letters identifying the radio station. The Frequency parameter provides the over-the-air broadcast frequency of the radio station. The Format parameter identifies the format or category of content broadcast by the radio station. The City, State, and Country parameters identify the city, state, and country of origin, respectively, of the radio station. The Description parameter provides a description, a monicker, or another identifier of the radio station.

The Station Logo Address parameter includes an electronic address of a logo or another image associated with the radio station. Preferably, the logo is stored locally at the server **102** to improve player performance. The Station WWW Address parameter provides an electronic address such as a URL identifying a Web site for the radio station. The Schedule Address parameter provides an electronic address for a site having a programming schedule for the radio station.

The Audio Stream Pointer Address (LQ) provides an electronic address of a lower-quality audio stream of content broadcast by the radio station. The Audio Stream Address (LQ) provides a file name and electronic address to verify the correct lower-quality audio stream for the station. The Audio Stream Bit Rate (LQ) parameter indicates the bit rate of the lower-quality audio stream.

The Audio Stream Pointer Address (HQ) provides an electronic address of a higher-quality audio stream of content broadcast by the radio station. The Audio Stream Address (HQ) provides a file name and electronic address to verify the correct higher-quality audio stream for the station. The Audio Stream Bit Rate (HQ) parameter indicates the bit rate of the higher-quality audio stream.

The Blackout Period parameter indicates times and/or dates for which content from the radio station is blacked out or otherwise inhibited from being received via the electronic network **100**.

The Album ID parameter includes a code to uniquely identify a music item such as an album. Preferably, the AudioNet Album ID is not relied upon to identify the album. The Album Title parameter includes a title of an album or another music item. The Format parameter identifies the format of the music item. The Artist Sort Name parameter provides a name, used for sorting purposes, of an artist associated with the music item. The Artist Name parameter provides a name of the artist to be used for descriptive purposes.

The Album Art Address parameter provides an electronic address of a cover art image associated with the music item. Preferably, the cover art image is stored locally by the server **102** to improve player performance. The Artist WWW Address parameter provides an electronic address, such as a URL, of a Web site for the artist. The Album Description parameter provides descriptive information for the music item. The Audio Stream Meta File Address parameter provides an electronic address, such as a MetaURL, for providing an audio stream of the music item. The Audio Stream Address parameter provides a file name (such as a .ra or .asf file name) and an electronic address identifying the audio stream of the music item. The Audio Bit Rate parameter indicates the bit rate or encoding bandwidth of the audio stream.

The Label Name parameter identifies a publishing entity for the music item, such as a record company or label. The Label Address parameter includes an electronic address, such as a URL, for a Web site of the record company or label.

TABLES III to VII show song data extracted from the content format to generate data in the second format. The data includes song information, artist information, recording information, rights information, watermark information, and miscellaneous information.

TABLE III

Parameter
Artist(s)
Song Title
Album Title
Composer (Music)
Composer (Lyrics)
Arranger
Publisher
Genre
Language

TABLE III illustrates song information parameters extracted from data having the content format. An Artist parameter identifies the artist or artists who performed the song. Separate parameters may be defined for the "headline" artist, as well as session artists, orchestras, conductors, choruses, etc. A Song Title parameter provides a title of a song or like music item. An Album Title parameter provides a title of an album containing the song. A Composer parameter identifies at least one composer of the song. An additional parameter may identify the writer of the songs lyrics. An Arranger parameter identifies at least one arranger of the song. The Publisher parameter identifies the publisher of the song. A Genre parameter indicates the genre or category of the song. The Language parameter indicates a language of the lyrics of the song. An ISRC ID parameter includes a 12-digit alphanumeric serial code comprised of a two-letter country code, a three-character author code, a two-digit year code, and a five-digit song identifier.

TABLE V illustrates recording information parameters extracted from data having the content format. A Format

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parameter indicates an audio or a video format of the song. A Recording Type parameter indicates a recording type of the song. A Publication Date parameter indicates a publication date for the song. A Country of Origin parameter identifies a country of origin for the song. A Playing Time parameter indicates a playing time of the song.

A Recording Studio parameter identifies one or more recording studios used to record the song. A Mix Down Studio parameter identifies one or more studios used to mix down the song. A Mastering Studio parameter identifies one or more studios used to master the song.

A Producer parameter identifies one or more producers of the song. An Engineer parameter identifies one or more recording engineers for the song. A Mastering Engineer parameter identifies one or more mastering engineers for the song. A Remixer parameter identifies any remixers of the song. An ISRC ID parameter includes a 12-digit alphanumeric serial code comprised of a two-letter country code, a three-character author code, a two-digit year code, and a five-digit song identifier.

TABLE V

PARAMETER
Format
Recording Type
Publication Date
Country of Origin
Playing Time
Recording Studio(s)
Mix Down Studio(s)
Mastering Studio(s)
Producer(s)
Engineer(s)
Mastering Engineer(s)
Remixer(s)
ISRC Code

TABLE VI illustrates rights information parameters extracted from data having the content format. A UPC Code parameter includes a 20-digit UPC code identifying the album. Preferably, the UPC is the convention to identify all music titles in a music library from radio station broadcast synchronization signals. A cross-referencing database can be used to translate between a cart code from a radio station to a UPC.

TABLE VI

PARAMETER
UPC Code
Copyright
Sound Recording Copyright
Performance Rights Agency
Mechanical Rights Agency
Record Label
Distributors
Date Encoded
Encoded By

A Copyright parameter provides copyright information for the song. A Sound Recording Copyright parameter provides sound recording copyright information for the song. A Performance Rights Agency identifies a performance rights agency for the song. A Mechanical Rights Agency identifies a mechanical rights agency for the song. A Record Label parameter identifies the record label for the song. A Distributors parameter identifies one or more distributors of the song.

A Date Encoded parameter indicates a date at which the song was encoded. An Encoded By parameter identifies a party that encoded the song.

TABLE VII illustrates watermark information parameters and miscellaneous parameters extracted from data having the content format. A Standard Watermark parameter provides a standard digital watermark for identifying a source of the song. A User-Defined Watermark parameter provides a user-defined digital watermark for the song. A Notes parameter includes notes associated with the song.

TABLE VII

PARAMETER
Standard Watermark
User-defined Watermark
Notes

Referring back to FIG. 1, the audience measuring component **154** monitors and reports listenership information for items played using the player **142**. Preferably, listening activity data is recorded for each instance of an end user playing an audio content item for a duration that attains or exceeds a predetermined listening time threshold. If the duration is less than the predetermined listening time threshold, the listening behavior is not considered significant, and the listening activity data is not recorded. Preferably, the predetermined listening time threshold is a global system parameter used for all audio content items.

Any of the herein-described audio content items, including but not limited to radio category items, events category items, library category items, and music category items, can be monitored in this way. The data can include an indication of the audio content item, an indication of which end user is playing back the item, a demographic of the end user, a time at which the audio content item is played, and a location of the end user.

Based upon any of the listenership information, the audience measurement component generates and provides reports including actual data and/or summaries thereof. These reports can include measurements that are familiar to advertisers, such as Average Quarter Hour, Cume, and time spent listening, which are familiar to radio advertisers. Each of these measurements can be derived from data tracked by the system. Each report can be specific to one or more radio stations associated with an entity such as a broadcasting company, or to one or more songs associated with an entity such as a record company, for example. The report is communicated to the entity to provide audience listenership information. The report can be communicated via the electronic network **100**. The report can be stratified by demographics such as gender, age, occupation, and geographical region of the end users. Each report can be automatically generated either at periodic or predetermined times or upon receiving a request therefor.

A particular embodiment of the audience measuring component **154** is as follows. When an end user initially enters the site providing the player **142**, an entry is made to a listener log database. The listener log database to which the entry is made depends upon which type of audio content item the end user is receiving. Preferably, the listener log database is selected from a radio log database, a music log database, an events log database, and a library log database. The entry includes an identifier of the end user (e.g. the CustomerID of the end user) and an identifier of the content (e.g. a radio station identifier, an event identifier, an album identifier, and/or a song identifier).

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As the end user continues to listen to the content item for a predetermined time threshold, a subsequent entry is made into the appropriate listener log database. This process is repeated so that a new entry is made after every period having the predetermined time threshold. If the content item has changed, the end time is recorded, and the new entry identifies the new content item. The new content is monitored in the same way as the previous content item. In this way, when the end user leaves the site, only the final seconds of listening (up to a maximum of the predetermined time threshold) are not tracked. Preferably, a clock (not illustrated) associated with the server **102** is used to reference all time-based data for the audience measuring component **154**.

The audience measuring component **154** periodically generates reports based upon the listener log databases. Each report can be generated daily, weekly, monthly, quarterly, or annually and communicated to a client (e.g. a radio station) via either paper or the electronic network **100** using electronic mail, the World Wide Web, or HTML. Each report can be dynamically created rather than stored. Preferably, the report indicates time of day listening habits and numbers of listeners. Demographic data of listeners can also be provided.

The report can include any combination of: (i) a measurement interval or period (e.g. daily, monthly, quarterly, or yearly), (ii) a measurement interval date range, (iii) call letters and band of the radio station; (iv) a count of unique listeners; (v) a count of all listeners; (vi) an average listening time per connection; (vii) an average listening time per unique listener; (viii) a graph interval (e.g. in minutes); (ix) an average simultaneous users; (x) an average quarterly hour listener metric; and (xi) a cumulative listener metric (cume).

The listener log databases can be maintained by archiving the data, and purging the databases on a daily basis. Preferably, the archived data includes a record of the start time and end time for each end user based upon a plurality of entries in the listener log databases.

Still with reference to FIG. **1**, a detailed description of the advertising component **160** is provided. The advertising component **160** maintains a database of advertising records. Each advertising record can include an advertisement type, an electronic address, such as a URL, for an audible or visible advertisement, client information identifying the advertiser, and information designating a target audience (e.g. based on customer display information, music, and radio station genre). Preferably, there are four types of advertisements: a banner advertisement, an attraction advertisement, a feature advertisement, and an audio advertisement.

A plurality of banner advertisements from the database are queued for display with the player **142**. The banner advertisements are successively displayed based on an automated process performed by the advertising component **160**. For example, a subsequent banner advertisement in the queue can be displayed every 150 seconds in the banner advertising region **1304** described with reference to FIG. **47**.

A plurality of attractions advertisements from the database are queued for display with the player **142**. The attractions advertisements are successively displayed based on an automated process performed by the advertising component **160**. For example, the attractions advertisements can be displayed in the attractions region **1306** or the region **1312** described with reference to FIG. **47**. Preferably, attractions advertisements are contextually associated with audio content played using the player **142**. For example, an attractions advertisement can promote an upcoming concert or an album signing related to audio content being played using the player **142**. In this way, the advertising component **160** can provide content-specific advertisements.

A plurality of feature advertisements from the database are selected based upon broadcast signals. The feature advertisements can include static information such as a radio station logo presented continuously while the player **142** is playing content from an associated radio station. The feature advertisements can include dynamic information such as an image of each album being played. Further, the feature advertisements can include a visible advertisement tailored to appear during a broadcast commercial. The feature advertisements can be displayed in the information space **1314** described with reference to FIG. **47**, for example.

The audio advertisements replace advertisements within the broadcast prior to communication to the client apparatus **106**. In this way, alternative Internet-based broadcasts and regional-based broadcasts can be generated.

The advertising component **160** can determine an associated subset of the advertisements targeted to each end user. Further, the advertising component **160** can determine the sequence in which the subset of advertisements are to be presented. Advertisements can be selected for an end user based on any of the following: online and off-line purchasing, demographics, psychographics, geographics, sonagraphics (e.g. listening preferences), and listener behavior. In this way, the advertising component **160** can provide user-specific advertisements.

The advertising component **160** tracks viewership and listenership of each of the advertisements in the database. Data is recorded indicative of which end users have seen or heard an advertisement in an active window for at least a predetermined time duration, and times at which the advertisement was seen or heard. The data can further track which end users click through or otherwise select each advertisement to get additional information, and track the contemporaneous activity of the end users.

The advertising component **160** generates reports based upon the tracking data. The reports correlate end user demographics with metrics of the viewing and listening data. Client advertising billing reports can also be generated based upon the tracking data.

It is noted that some of the advertising images and audio files can be cached to the storage device **132** of the client apparatus **106** to improve system performance. Audio files can be pre-queued and pre-buffered for streaming at the client apparatus **106**. Either in-band signaling or out-of-band signaling can be used to trigger the images and audio files. An example of in-band signaling includes a tone encoded within an audio data stream to identify and trigger content insertion. An example of out-of-band signaling includes data streamed with the audio data stream.

It is also noted that to improve system performance, the server **102** can provide the client apparatus **106** with content, in addition to the active content, based on a nearest subset of content selections on the graphical radio dial, presets, or favorites based on the end user's listening behavior. The additional content can be pre-buffered by the client apparatus **106**.

Referring to FIG. **59** in conjunction with FIG. **1**, the herein-described components of the server **102** can interact with the player **133** (and optionally player **142**) to provide personalized content to each of a plurality of end users of client apparatuses **104** and **106**. Personalized content can be provided to a first user by: (i) communicating from the server **144** first audio content **1700** associated with a broadcast to a first user location **106**, together with control data with information relating to the content, the broadcaster, the user or other attributes such as location of the user, examples of which are set out below, (ii) selecting (at the server **102**) second content **1710** based upon a first user profile (preferably located at the server **102**), and (iii) communicating a first signal to the first user location.

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The first signal to the first user location comes from a server such as server **102** or **144**, and the player (player **142** and player **133** in combination) causes switching of content from a first server **102** to a second server **144** or from the server **144** to another server (not shown), from which the inserted advertisement or other material is derived.

The switching of content can take place at the player **133** or at the player **142**. In the former case, upon detection of the relevent code, the player **133** can cause the additional content to be inserted from either a local storage device **132** or from the additional content server (not shown in FIG. **1**).

Upon registration of the client with the server **102** the server will preload a queue of advertisements or other content items into the storage device or will preload addresses or URLs for those content items into the storage device **132**. Thereafter, as the client **106** receives content from the server **144** and as it identifies an insertion point **1720** from the associated data, instead of presenting any content that it receives from server **144** at that insertion point, the client will present one of the preloaded advertisements or other content items from its storage device **132**.

These advertisements can be of appropriate length in the case of audio advertisements such that an insertion point **1720** that indicates an opportunity for (for example) a twenty or thirty second sound advertisement can cause such an advertisement to be retrieved from the storage device **132**. Alternatively, these insertion points **1720** can indicate addresses or URLs which cause the client **106** to turn to another server (not shown) to find a content item to be inserted at that point, and that other server will decide what that content should be.

Another example of an insertion item could be a complete song from a local artist, and the insertion point **1720** indicates that this should be the item inserted, whereupon the client refers to the local server and the server delivers whatever is the selected local song for the selected local artist.

Instead of using insertion points **1720** identifiable in the data stream from the primary content server **144**, the server **102** can provide the client **106** with a schedule of insertion times and the client **106** can maintain a real time clock and at the designated insertion times it will turn to its next insertion item for insertion into the content being received from server **144**. It is preferred, in the case of streaming audio, that data is interleaved into the audio indicating such information as to the artist or song currently being played. This interleaved data can be used by the client **106** as the trigger for causing a replacement of the data being received from server **144**. For example an entire song could be replaced. Alternatively, that data could have a separate logical connection rather than being interleaved into the audio.

Of particular interest are cases in which the first audio content **1700** and the first signal are communicated via an electronic network including at least one of the Internet, an intranet, and an extranet. The first signal synchronizes playback of the second content with respect to playback of the first audio content **1700**.

The second content **1710** can include a first at least one image selected in dependence upon the first user profile **150**. In this case, the first signal is to synchronize display of the first at least one image to playback of the first audio content **1700**. The first at least one image can be selected further in dependence upon content within the first audio content **1700**. Of particular interest are cases in which the first image is a content-specific image and/or a broadcaster-specific image.

Personalized visual content can be provided to a second user **104** by communicating the first audio content **1700** associated with the broadcast (from server **144**) to a second user location **104**, selecting a second at least one image based upon second user profile stored in customer profile **150**, and communicating a second signal to the second user location (e.g. from server **102** or from another server not shown). The second signal synchronizes display of the second at least one image to playback of the first audio content **1700**. The second at least one image can differ from the first at least one image.

The second content **1710** can include second audio content selected in dependence upon the first user profile. In this case, the first signal is to synchronize playback of the second audio content with respect to playback of the first audio content **1700**. The second audio content can be synchronized for insertion within the first audio content **1700**. Of particular interest are cases in which the second content **1710** includes at least one of advertising content and programming content.

Personalized audible content can be provided to the second user by communicating the first audio content **1700** associated with the broadcast to the second user location, selecting third audio content based upon the second user profile, and communicating a second signal to the second user profile, and communicating a second signal to the second user location to synchronize playback of the third audio content with respect to playback of the first audio content **1700**. To personalize the content, the third audio content can differ from the second audio content. The third audio content can be synchronized for insertion within the first audio content **1700**.

Each user profile is updated by monitoring information associated with user specific, apparatus-independent use of a plurality of audio content player apparatus via the electronic network. For example, the user profile for a user can be based upon his/her use at both the client apparatus **106** and the client apparatus **104**. Each user profile can include transaction information, demographic information, psychographic information, geographic information, sonagraphic information, and listening behavior information for its associated user.

Thus, there has been described herein several embodiments including preferred embodiments of audio content player methods, systems, and articles of manufacture.

Embodiments of the present invention can provide an Internet-based digital audio service that combines an easy-to-use, customizable audio player interface with a wide variety of audio content. Users are able to access audio-on-demand through an archive of music and spoken word titles, and are able to tune to live radio broadcasts from around the world. Further, content information is integrated with content distribution. In this way, an end user can obtain information about content to which he/she is listening. Additionally, the end user is provided a means for purchasing the content, such as music content, to which he/she is listening.

User preferences and behavior are tracked to generate information of interest for each user. This information can relate to his/her music taste, geographical location, and/or other personalized criteria. The information can also be used by radio stations and record labels to determine which music is worth playing.

Embodiments of the player advantageously support browsing of audio content on the Internet using two metaphors: (i) a radio station metaphor and (ii) a record store listening booth metaphor.

Additional features include: concurrent display of visual information based on material broadcast by a radio station, paging of the end user for scheduled events, an interactive schedule for radio programming, listing available stations for a day, and a map to show a location of origin of a radio station.

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It is noted that as an alternative or in addition to providing audio content, the herein-described methods and systems can be used to provide video content.

It will be apparent to those skilled in the art that the disclosed embodiments may be modified in numerous ways and may assume many forms other than the preferred form specifically set out and described above.

Accordingly, it is intended that the appended claims cover all such modifications which fall within the true spirit and scope of the invention.

What is claimed is:

1. A method of operation for a server that interacts with a plurality of client apparatuses to provide personalized content to each client apparatus, the method comprising the steps of:

communicating a first media content and control data associated with the first media content from the server to a particular client apparatus of the plurality of client apparatuses, wherein the control data indicates at least one insertion point of the first media content;

retrieving a user profile associated with the particular client apparatus;

selecting a second media content based on the user profile; and

communicating the second media content and a control signal associated with the second media content from the server to the particular client apparatus, wherein the control signal instructs the particular client apparatus to insert the second media content at the at least one insertion point of the first media content.

2. The method of claim 1, wherein the broadcast is communicated via wireless communication to at least one wireless receiver and via wireline communication to the particular client apparatus.

3. The method of claim 2, wherein the at least one wireless receiver and the particular client apparatus receive the first media content, but only the particular client apparatus may receive the second media content.

4. The method of claim 1, further comprising the step of retrieving the user profile from a second server separate from the server.

5. The method of claim 1, further comprising the step of retrieving the second media content from a second server separate from the server.

6. The method of claim 1, further comprising the step of storing at least one of the second media content and an address of the second media content in a queue of the particular client apparatus.

7. The method of claim 6, further comprising the steps of:

detecting the at least one insertion point based on the control signal; and

in response to detecting the at least one insertion point, presenting the second media content at the at the particular client apparatus instead of any content of the first media content at the at least one insertion point.

8. The method of claim 1, wherein the first media content includes at least one of an audio content, an image content, and a video content.

9. The method of claim 1, wherein the first media content, the control data, and the control signal are communicated to the particular client apparatus via an electronic network including at least one of an Internet, an intranet, and an extranet.

10. The method of claim 1, wherein the control signal synchronizes playback of the second media content with playback of the first media content.

11. The method of claim 1, wherein the second media content includes at least one image selected based on the user profile.

12. The method of claim 1, wherein the second media content includes at least one image selected based on the first media content.

13. The method of claim 12, wherein the at least one image is one of either a content-specific image and a broadcaster-specific image.

14. The method of claim 1, wherein the second media content includes at least one of an advertising content and a programming content.

15. The method of claim 1, further comprising the step of generating the user profile before the step of accessing the broadcast intended for communication to the plurality of client apparatuses.

16. The method of claim 1, wherein the user profile is updated by monitoring operational activity of the particular client apparatus.

17. The method of claim 1, wherein the user profile is updated by monitoring operational activity of a particular group of client apparatuses.

18. The method of claim 1, wherein the user profile includes at least two of transaction information, demographic information, psychographic information, geographic information, sonagraphic information, and listening behavior information.

19. The method of claim 1, wherein

the step of communicating the first media content and the control data to a particular client apparatus includes the step of communication the first media content and the control data to a second client apparatus;

the step of retrieving a user profile associated with the particular client apparatus includes the step of retrieving a second user profile associated with the second client apparatus;

the step of selecting a second media content based on the user profile includes the step of selecting a third media content based on the second user profile, wherein the third media content is different from the second media content; and

the step of communicating the second media content and a control signal associated with the second media content to the particular client apparatus includes the step of communicating the third media content and a second control signal associated with the third media content to the second client apparatus, wherein the second control signal instructs the second client apparatus to insert the third media content at the at least one insertion point of the first media content.

20. A method of operation for a server that interacts with a plurality of client apparatuses to provide personalized content to each client apparatus, the method comprising the steps of:

communicating a first media content and control data associated with the first media content from the server to a particular client apparatus of the plurality of client apparatuses, wherein the control data indicates a schedule of insertion times;

retrieving a user profile associated with the particular client apparatus;

selecting a second media content based on the user profile; and

communicating the second media content from the server to the particular client apparatus, wherein the particular client apparatus maintains a time clock to determine when to insert the second media content into the first media content based on the control data.

* * * * *

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APPENDIX C

A copy of U.S. Patent No. 6,389,467 to Eyal.

US006389467B1

(12) **United States Patent**
Eyal

(10) **Patent No.: US 6,389,467 B1**
(45) **Date of Patent: May 14, 2002**

(54) **STREAMING MEDIA SEARCH AND CONTINUOUS PLAYBACK SYSTEM OF MEDIA RESOURCES LOCATED BY MULTIPLE NETWORK ADDRESSES**

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(73) Assignee. **Friskit, Inc.**, San Francisco, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/563,250**

(22) Filed: **May 2, 2000**

Related U.S. Application Data

(60) Provisional application No. 60/177,786, filed on Jan. 24, 2000.

(51) **Int. Cl.**[7] **G06F 15/173**

(52) **U.S. Cl.** **709/223**

(58) **Field of Search** 709/231, 245, 707/10, 345/327

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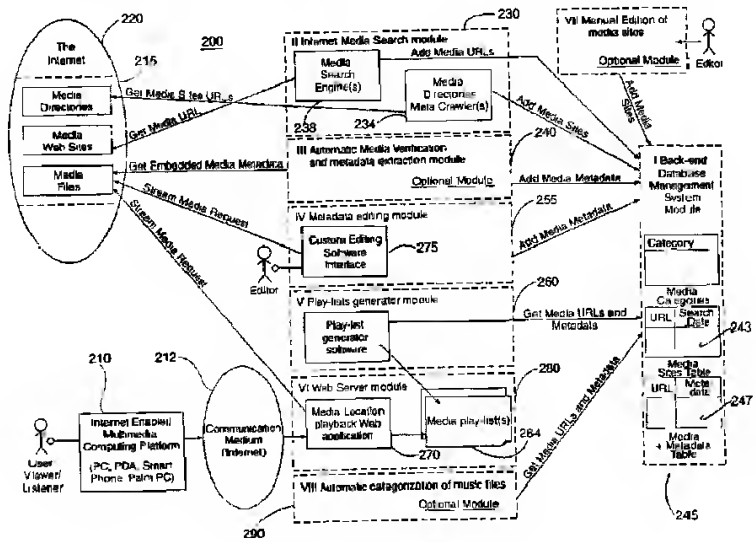
Primary Examiner—Krisna Lim
(74) *Attorney, Agent, or Firm*—Hickman Palermo Truong & Becker LLP; Van Mahamedi

(57) **ABSTRACT**

A network enabled device receives search criteria and accesses a memory that includes a plurality of network addresses. The memory associates each address with one or more classes of information. Each address in the memory locates a media network resource. A plurality of the addresses are selected using the search criteria. The selected addresses are signaled to the network enabled device. A media playback component on the network enabled device sequentially plays back the media resources provided by at least some of the selected addresses automatically.

68 Claims, 22 Drawing Sheets



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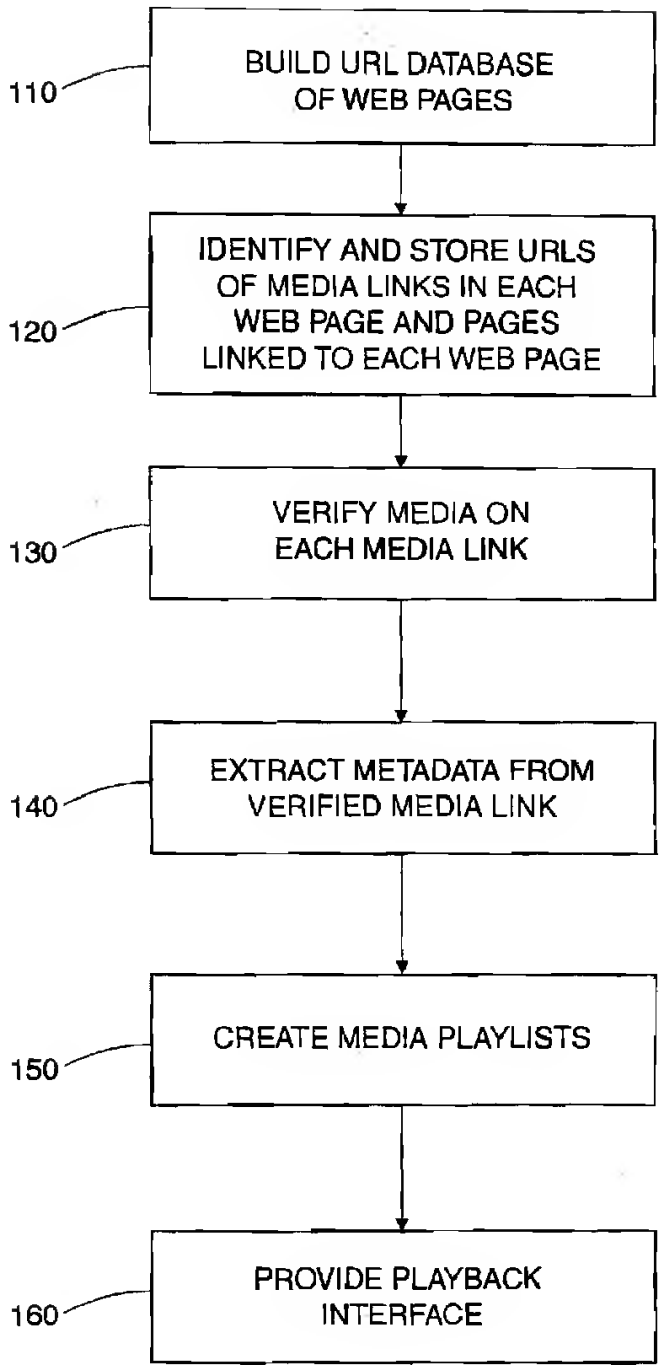

FIG. 1

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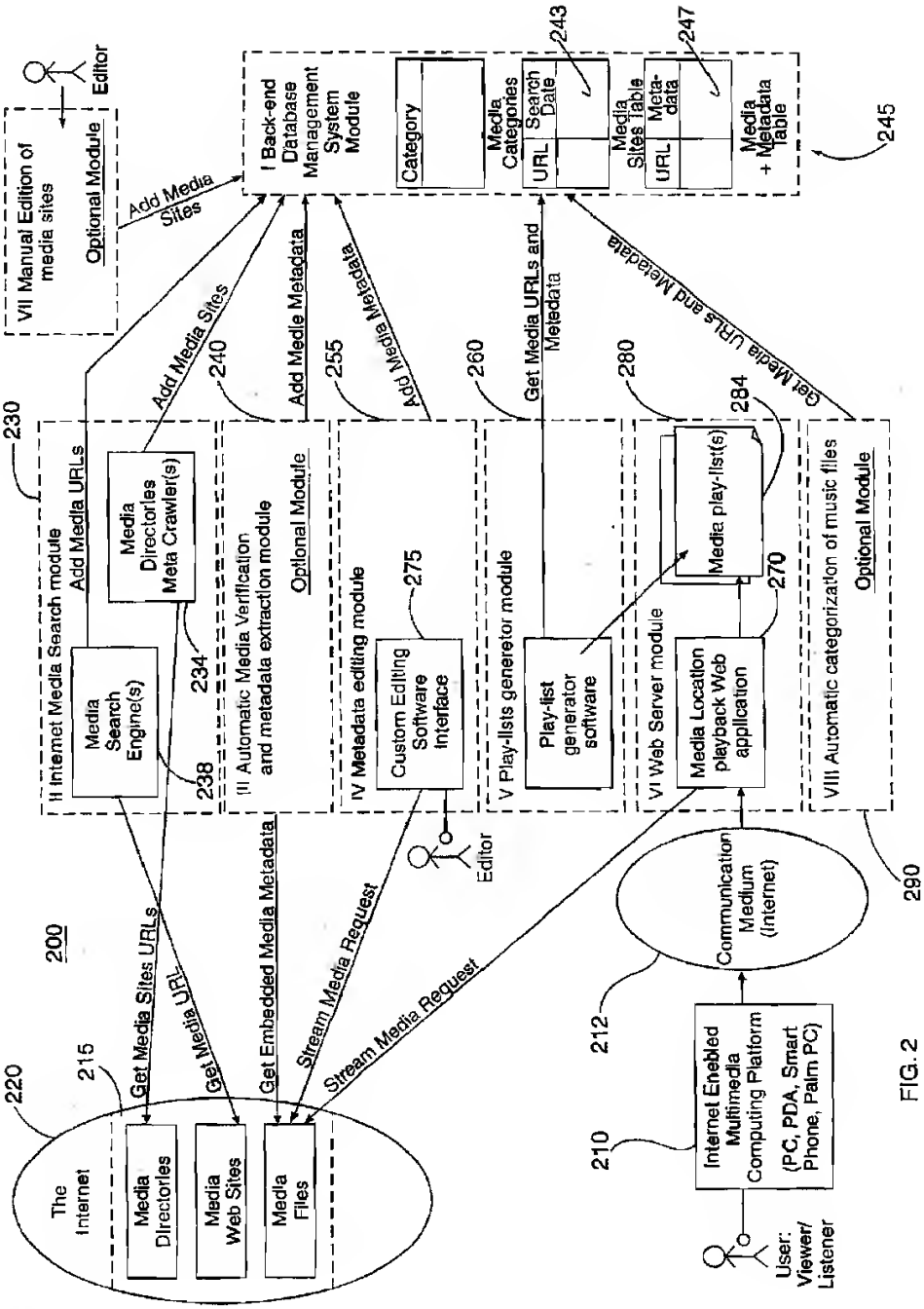

FIG. 2

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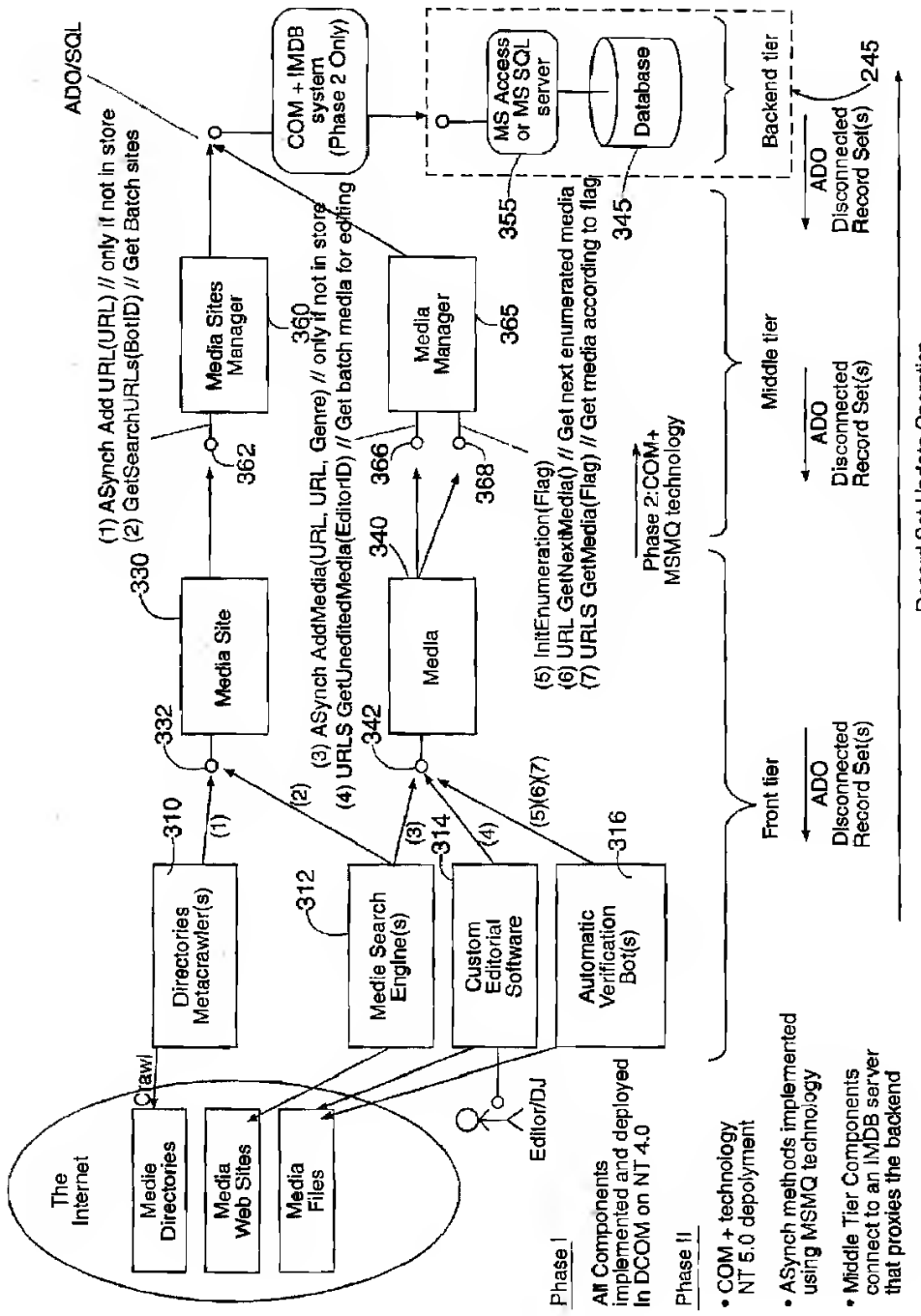

FIG. 3

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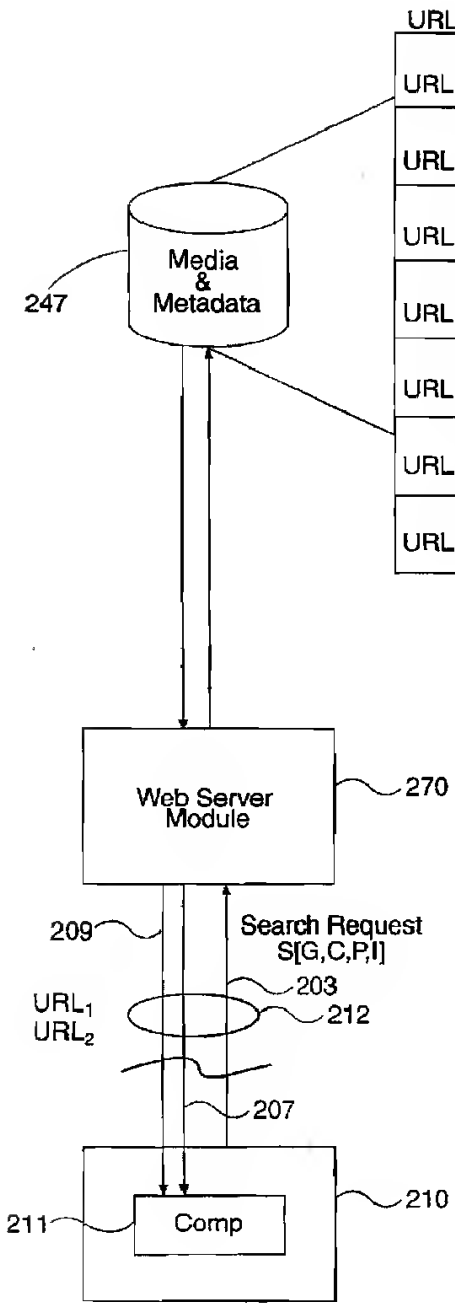

URL	G	DT	C	I	Play 1	Play 2	Play 3
URL_1	G_1	WAV	G_{11}	I_1	X		X
URL_2	G_2	JPEG	G_{21}	I_2		X	X
URL_3	G_1	WAV	G_{11}	I_3	X		X
URL_4	G_3	MPEG	G_{31}	I_4	X		X
URL_5	G_2	JPEG	G_{21}	I_5			X
URL_6	G_3	MOV	G_{32}	I_6			X
URL_7	G_1	MOV	G_{12}	I_7		X	X

FIG. 4

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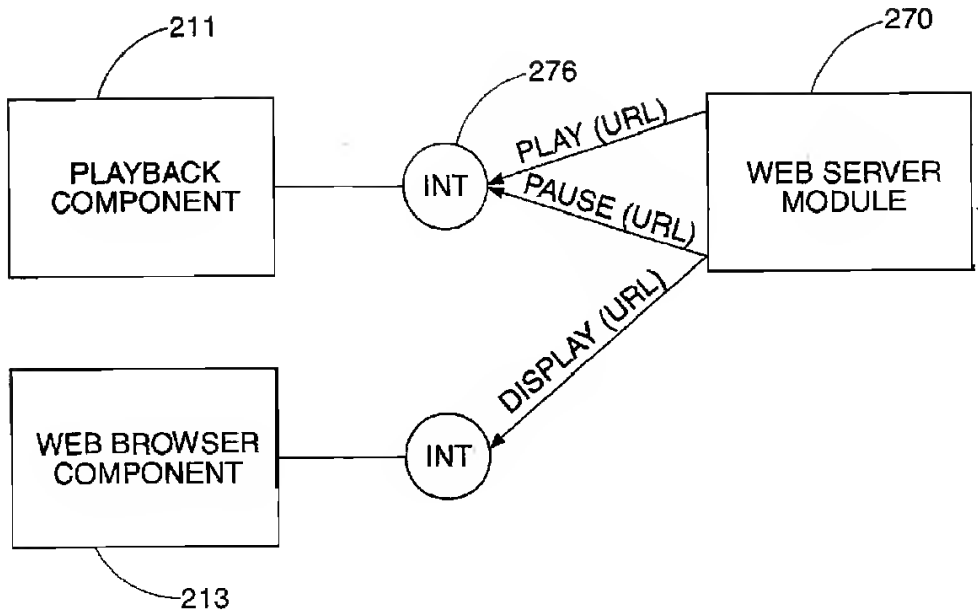

FIG. 5

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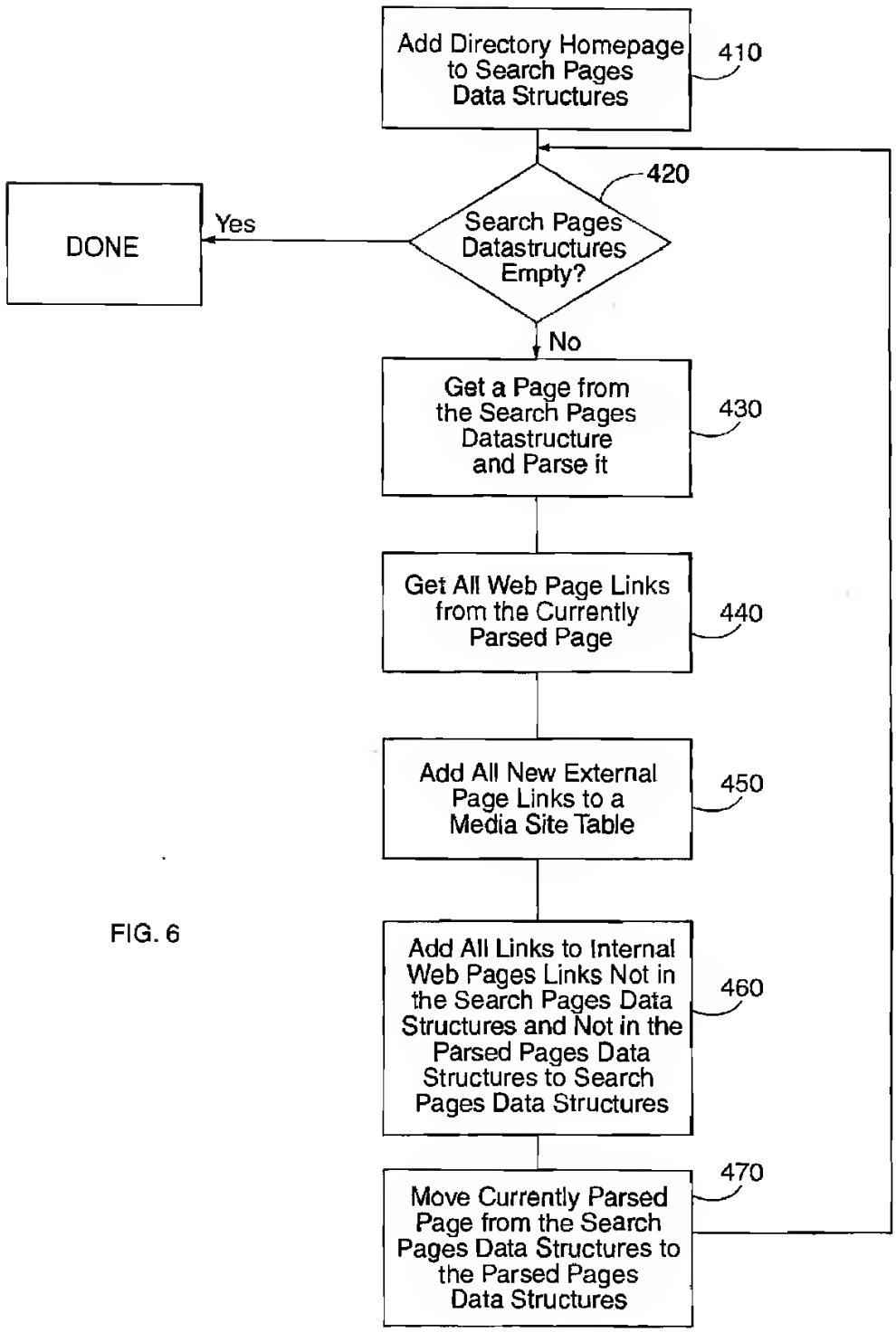

FIG. 6

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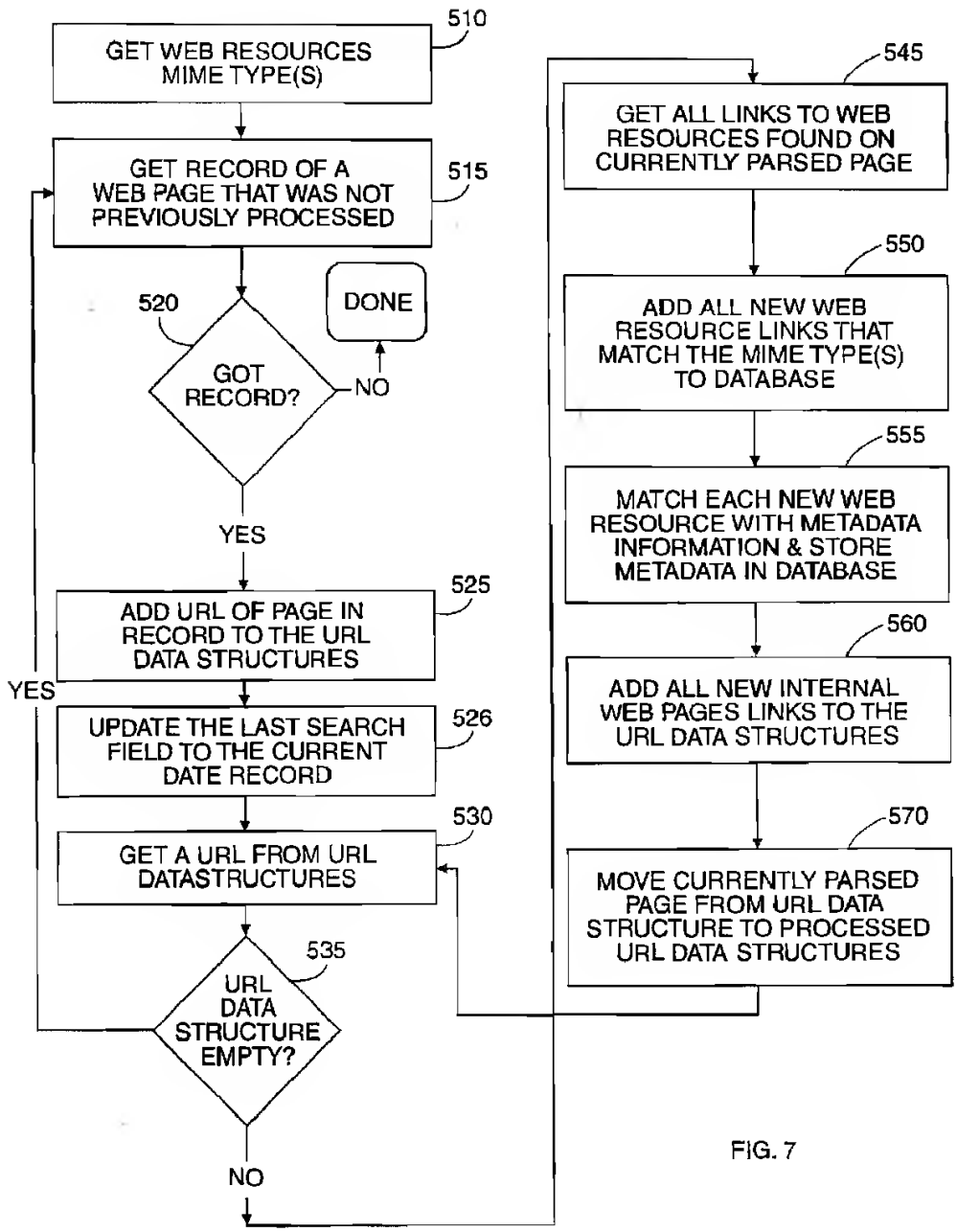

FIG. 7

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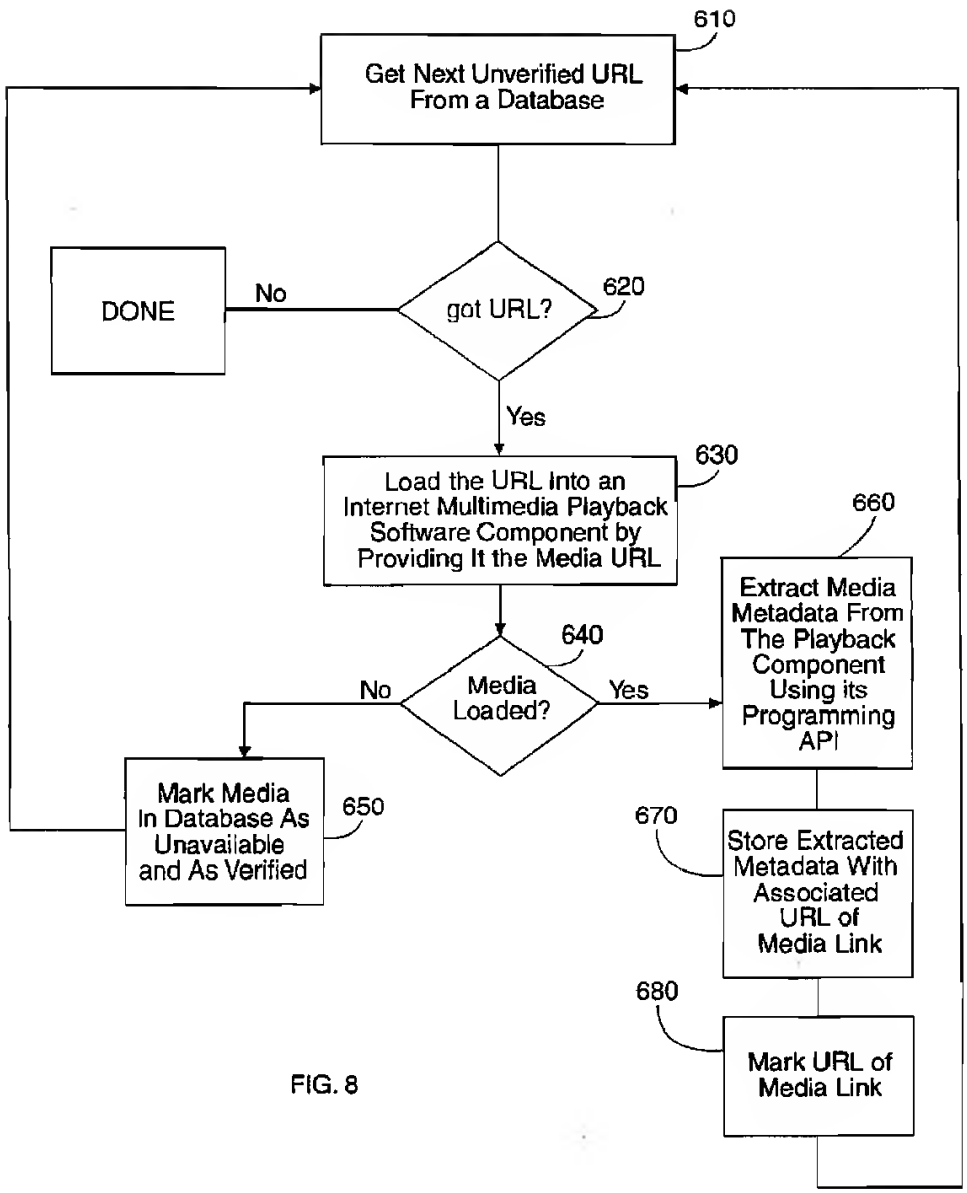

FIG. 8

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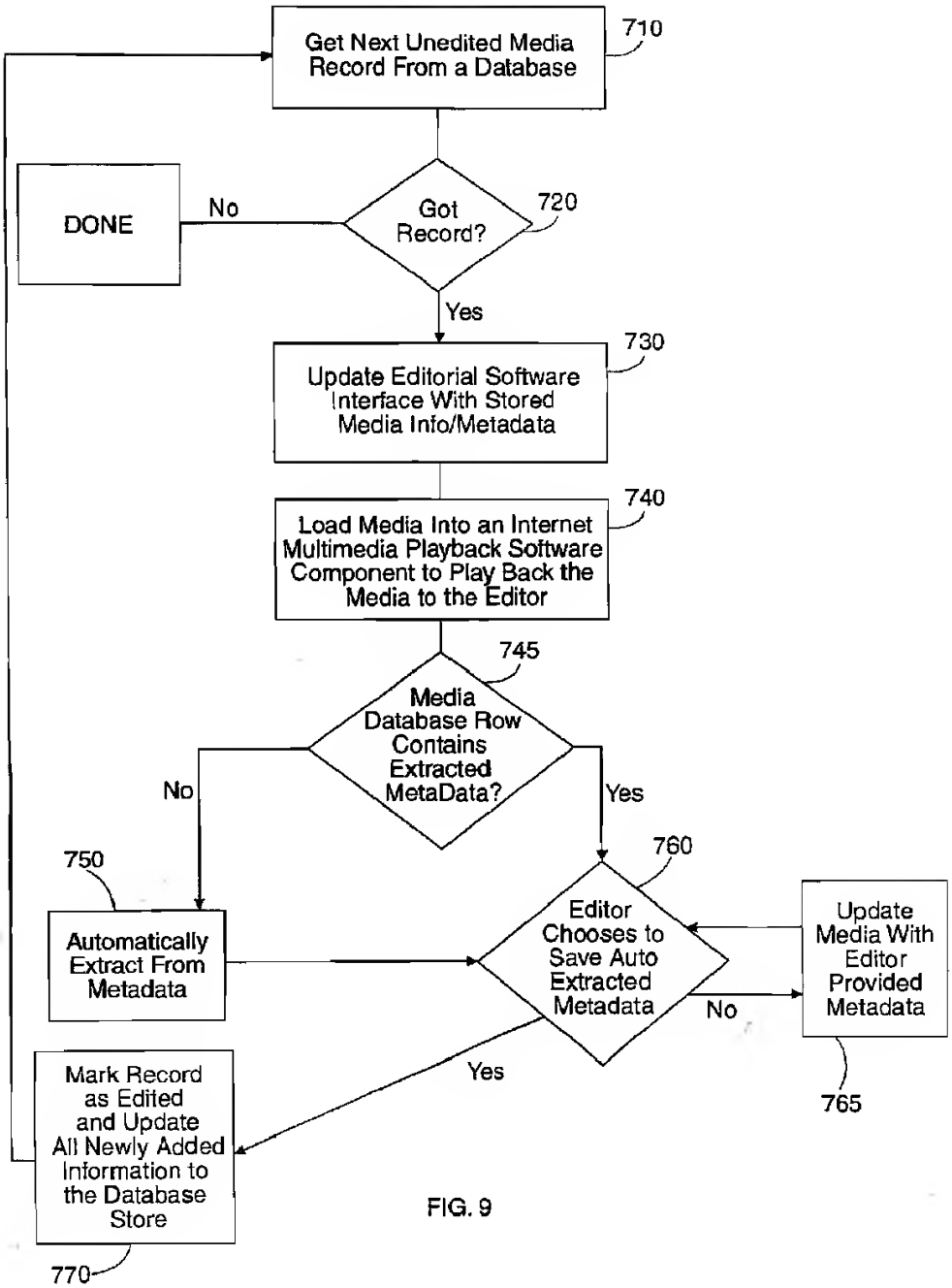

FIG. 9

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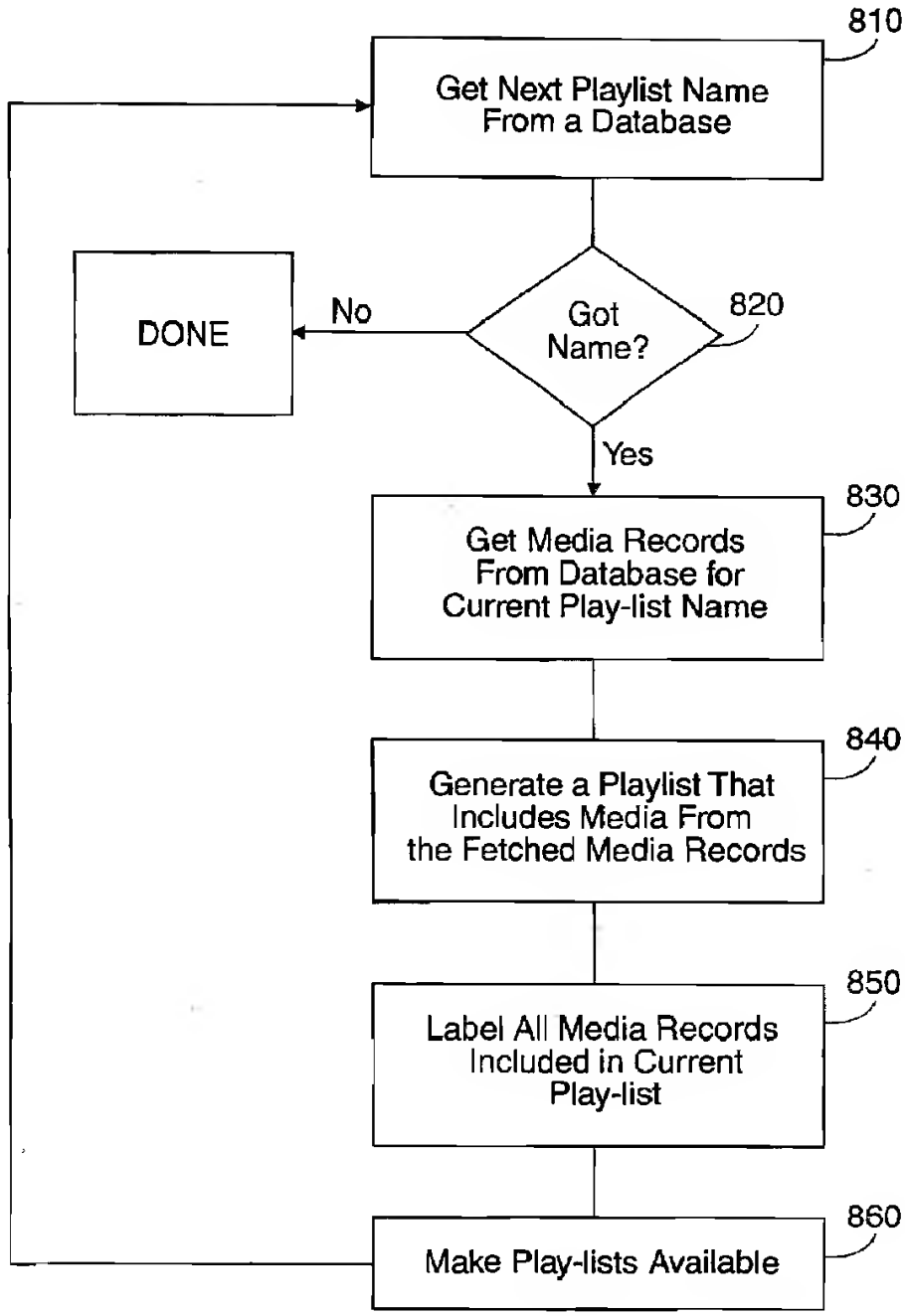

FIG. 10

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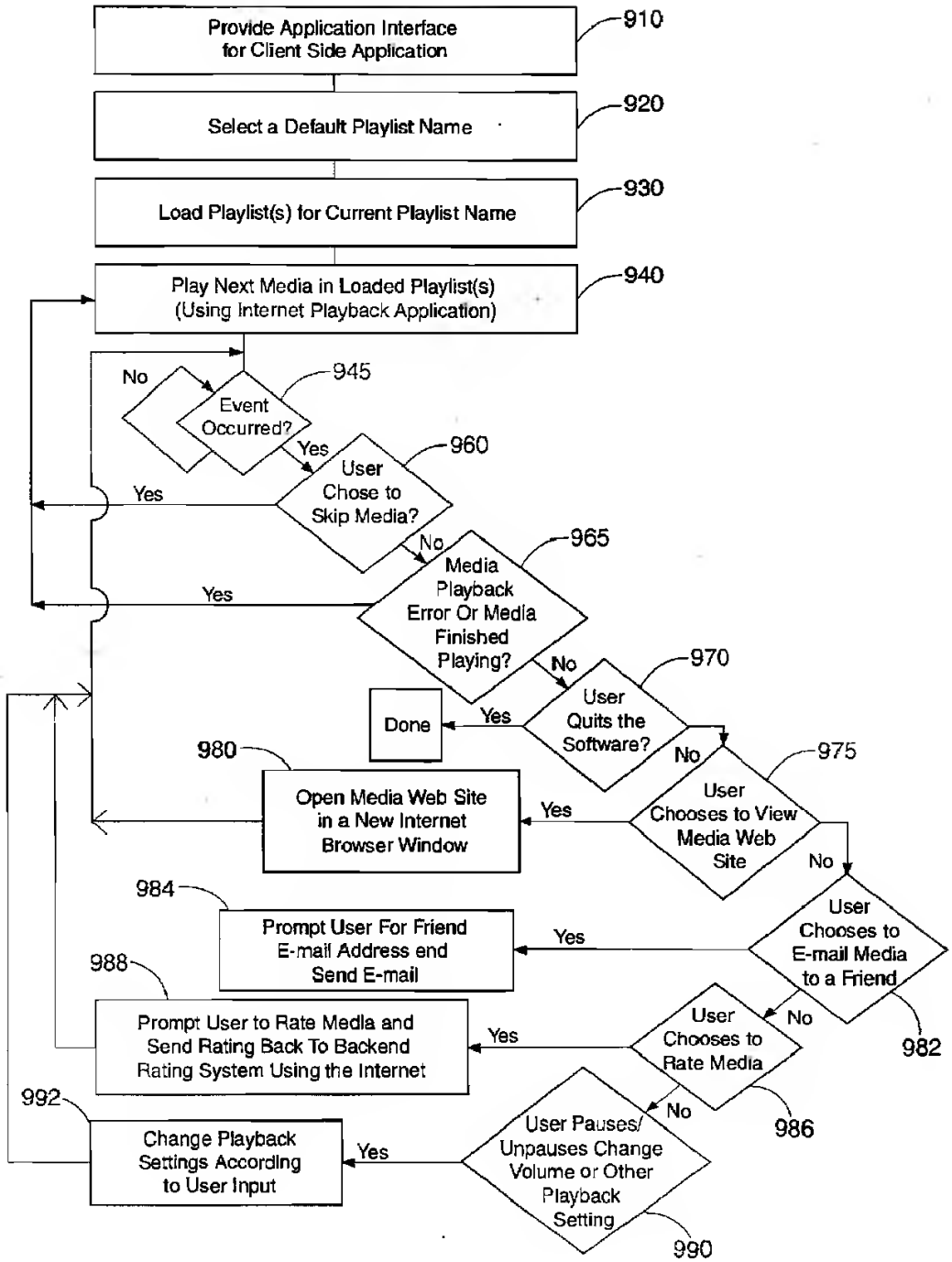

FIG. 11

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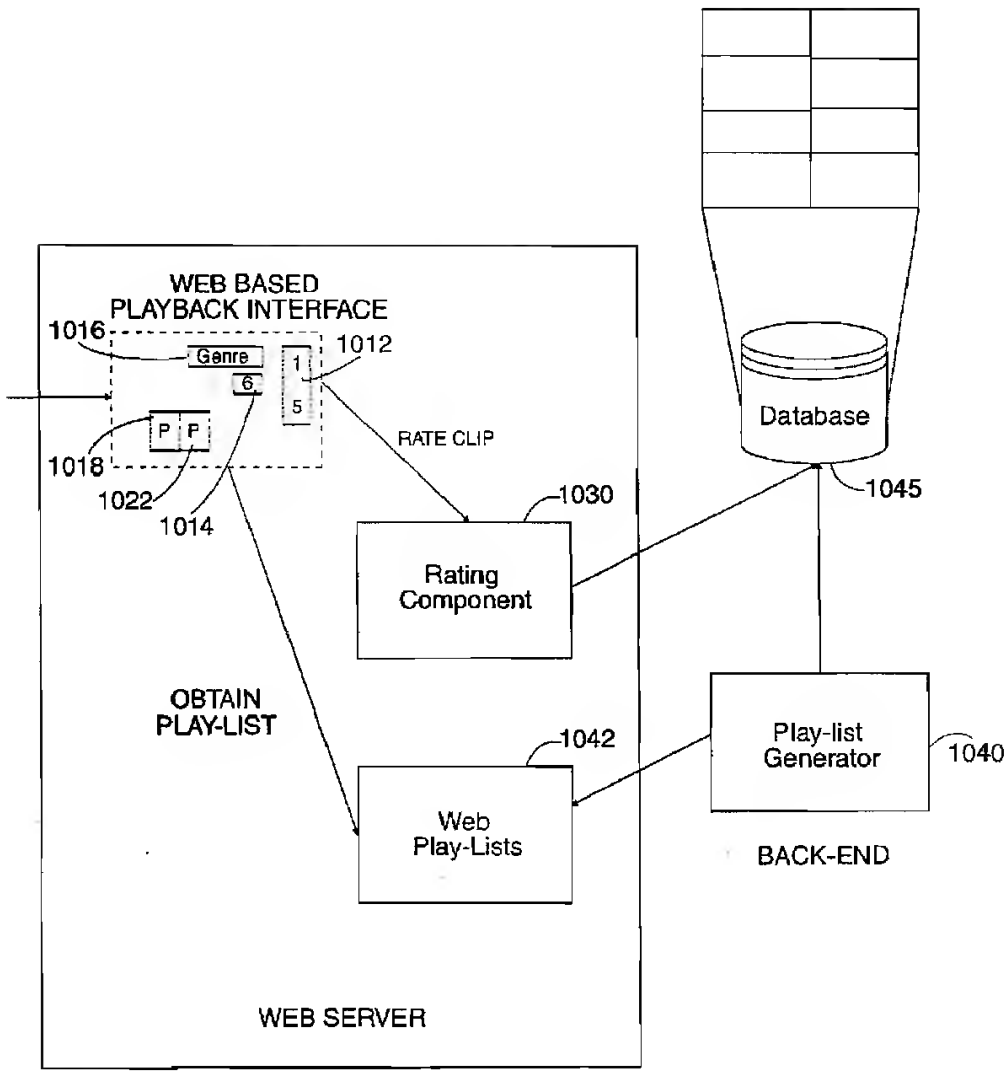

FIG. 12

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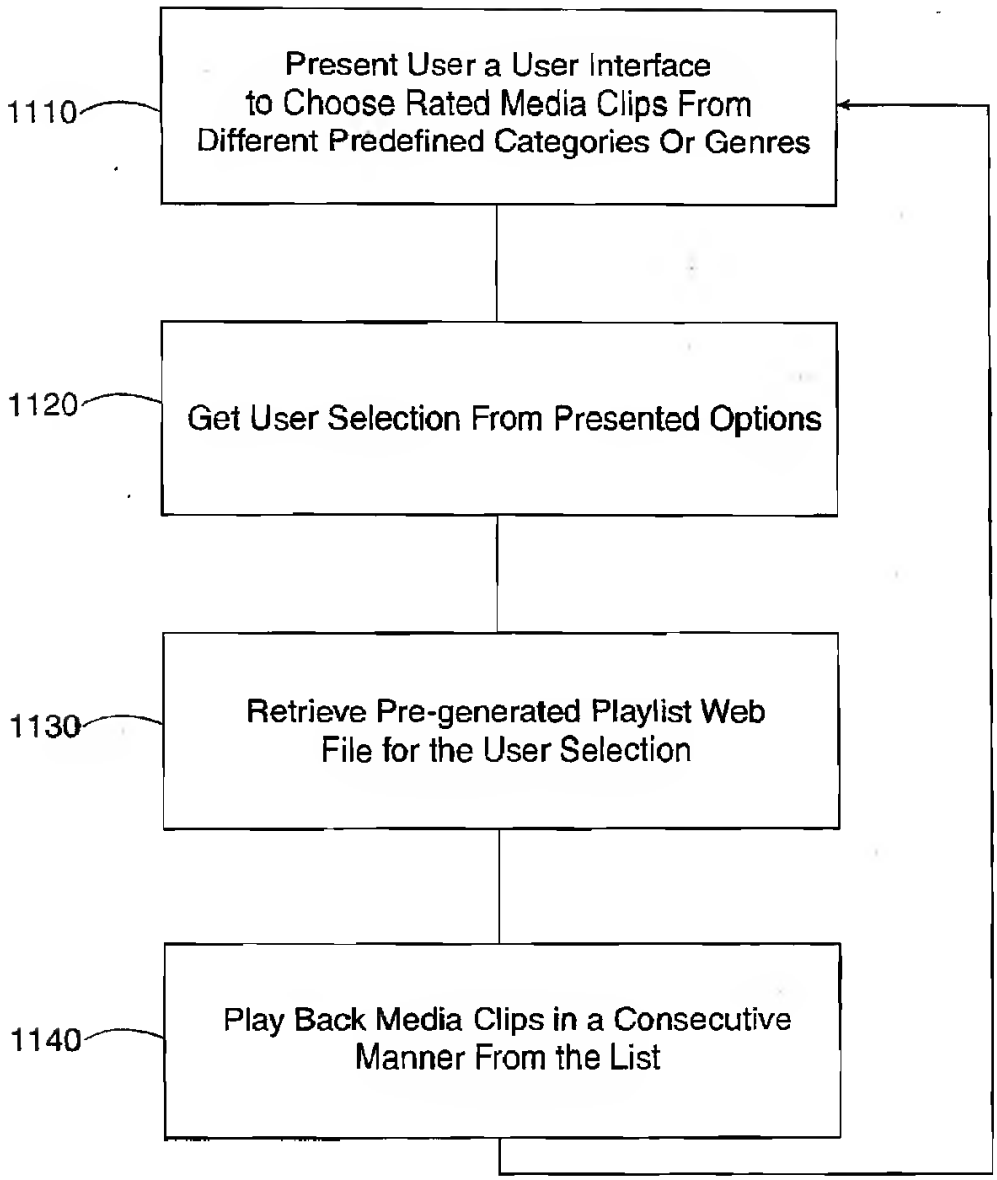

FIG. 13

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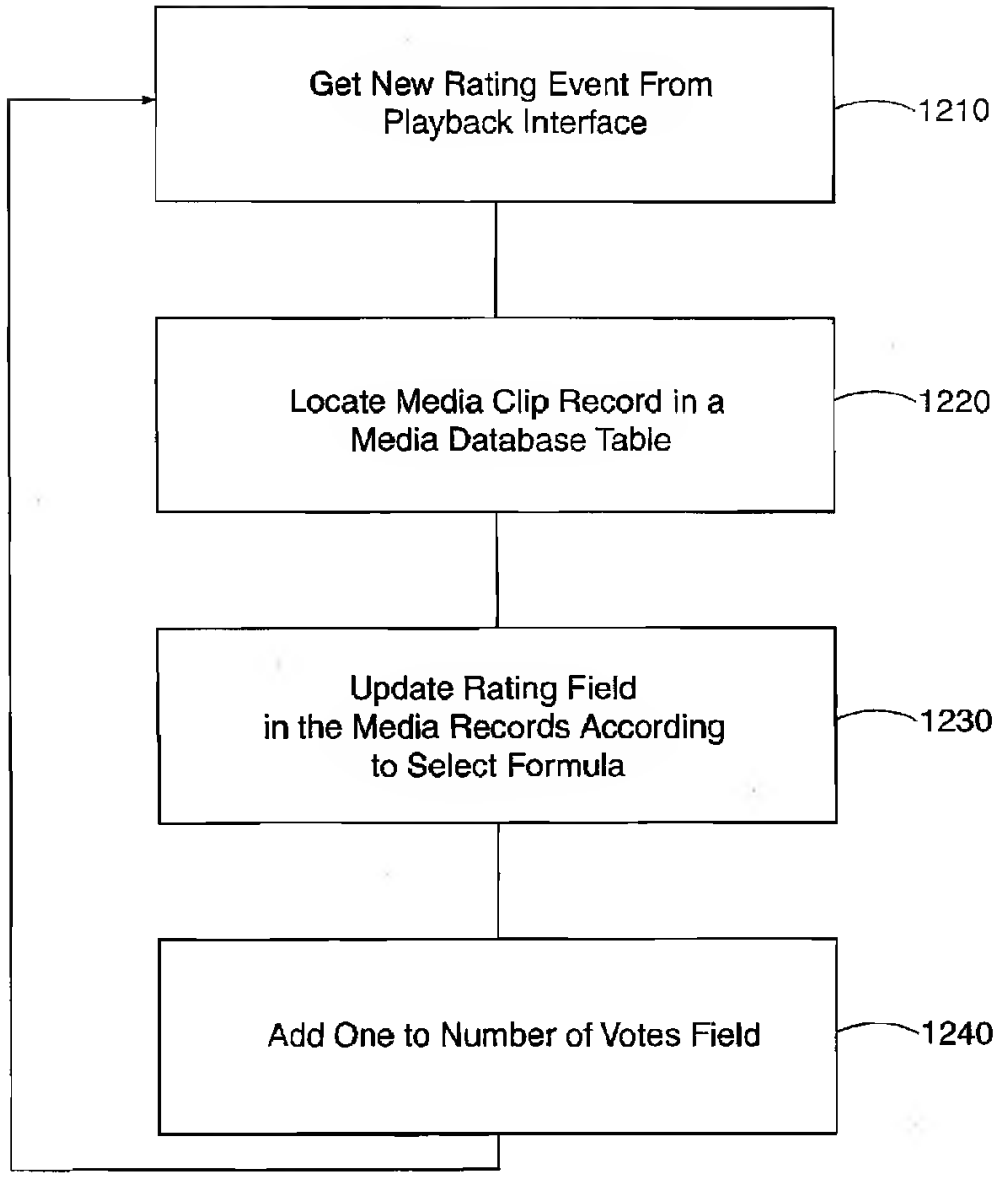

FIG. 14

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MEDIA DATABASE TABLE

Media URL	Number of Votes	Rating	Additional Info
URL	O... N	O... Max Rating	

FIG. 15

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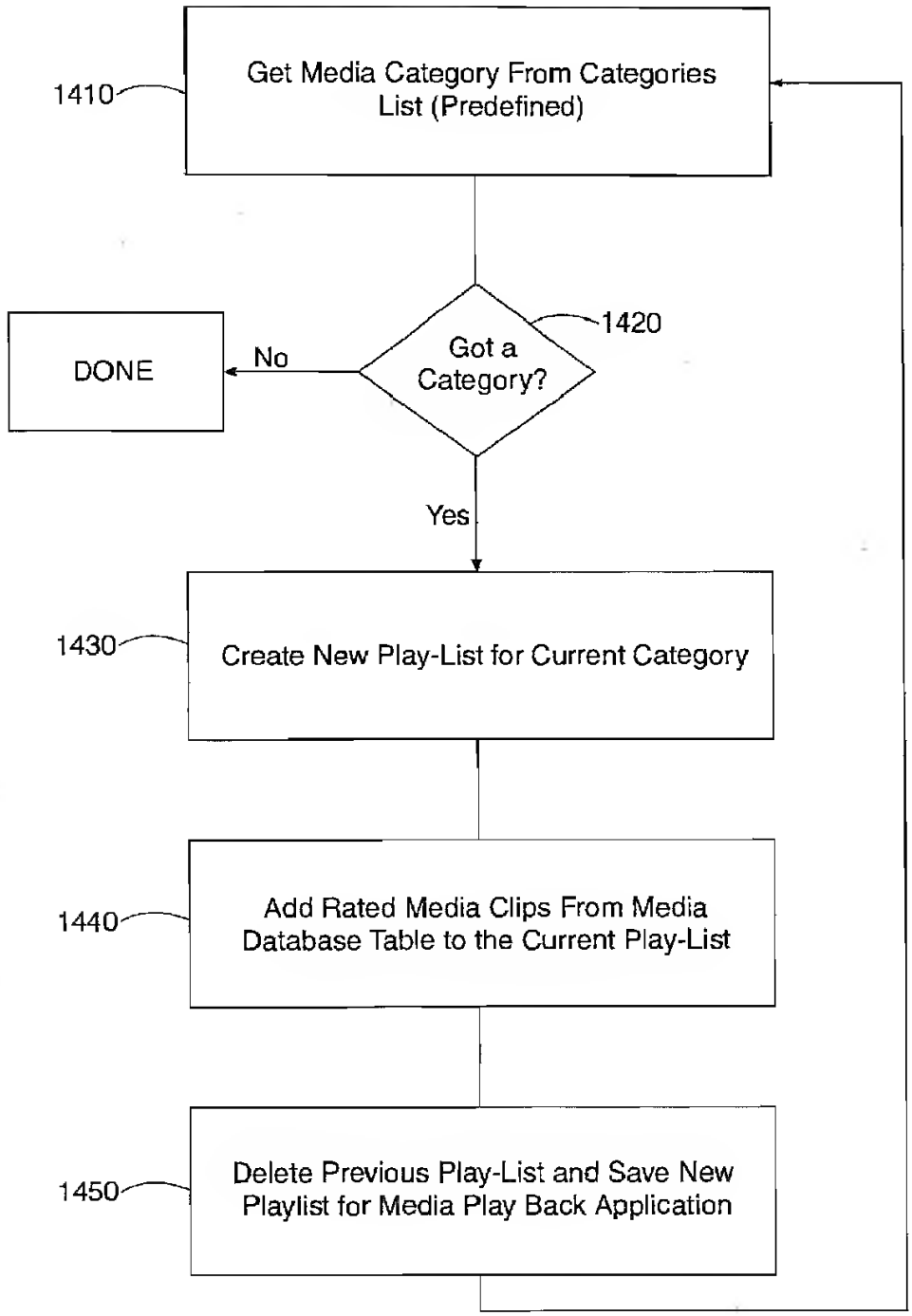

FIG. 16

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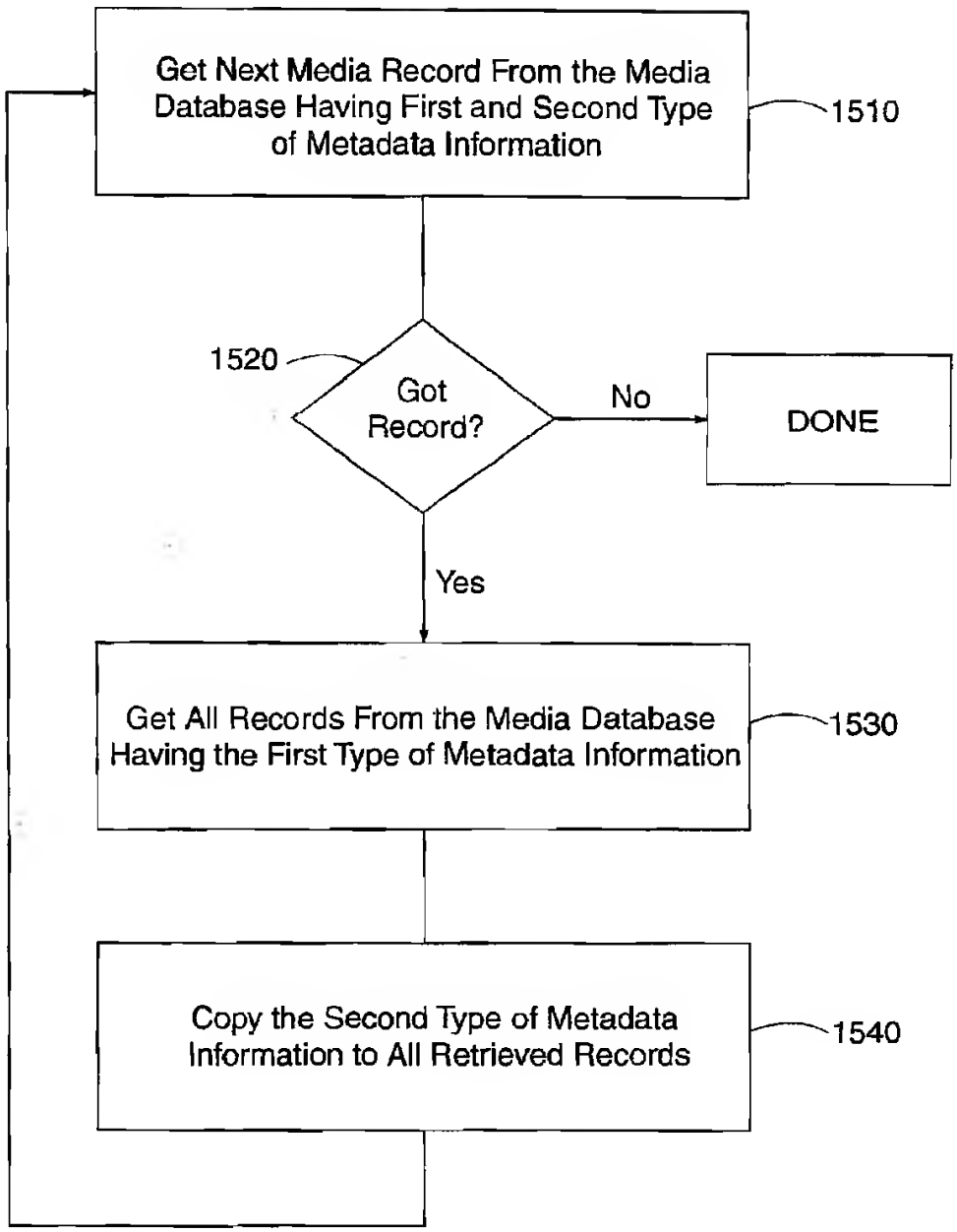

FIG. 17

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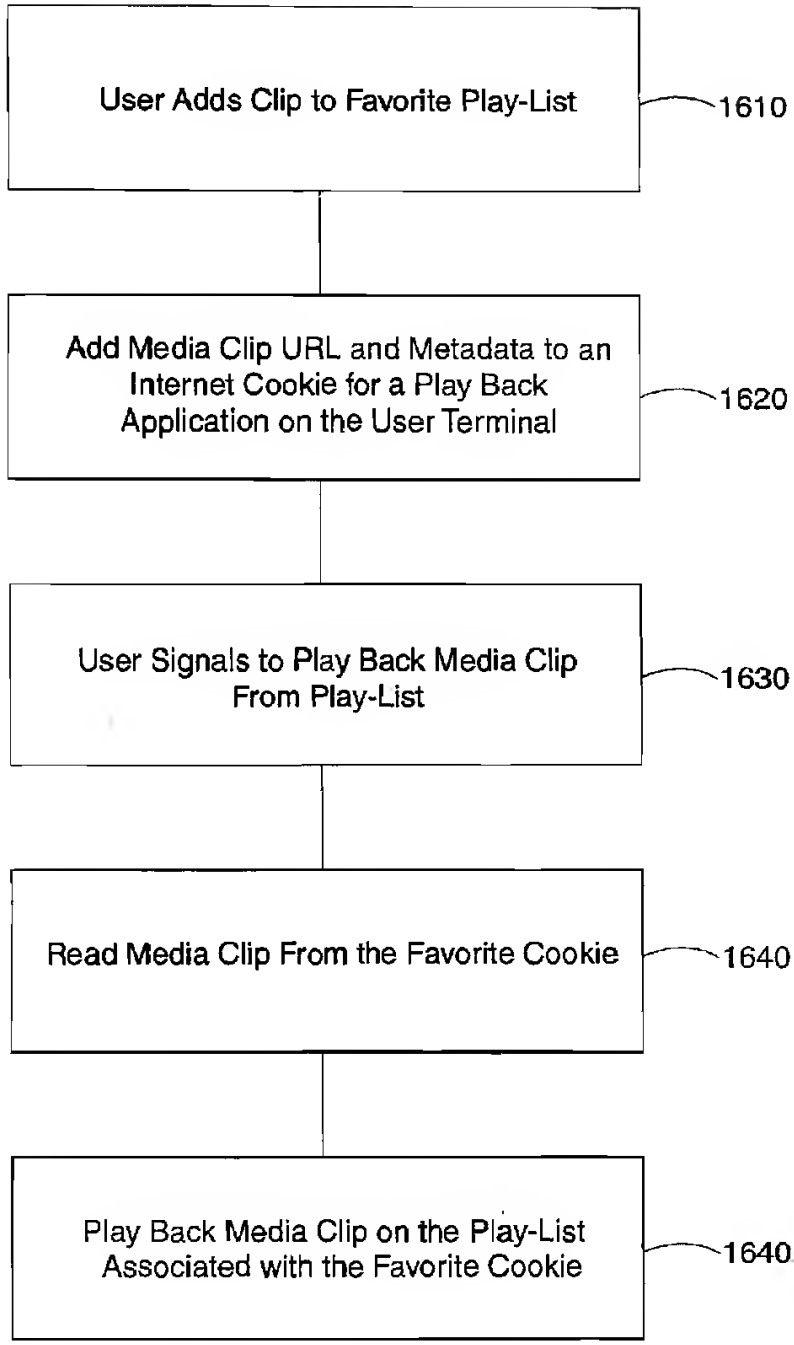

FIG. 18

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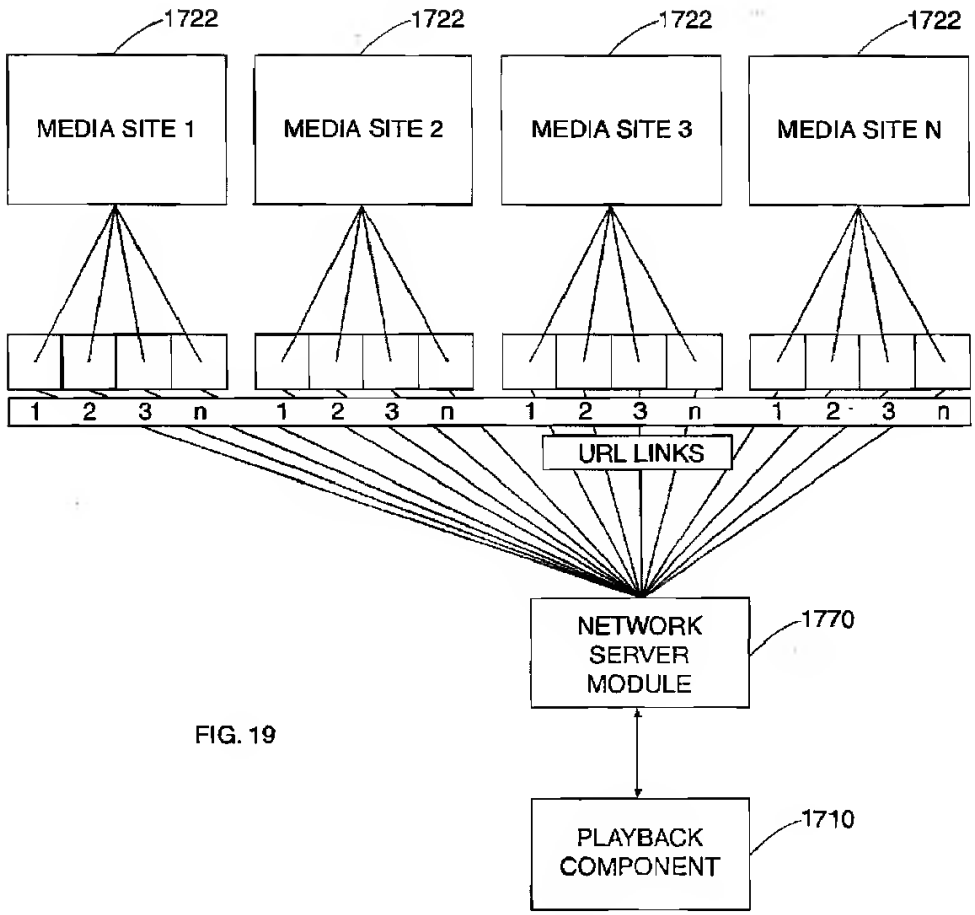

FIG. 19

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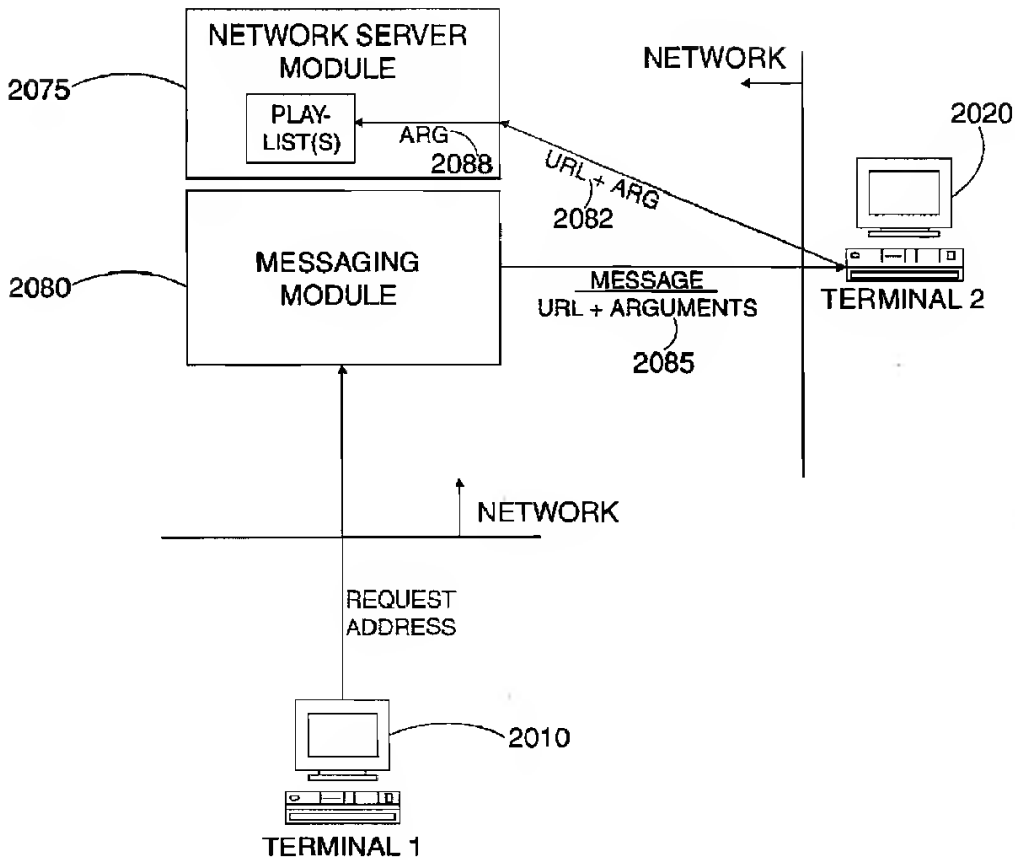

FIG. 20

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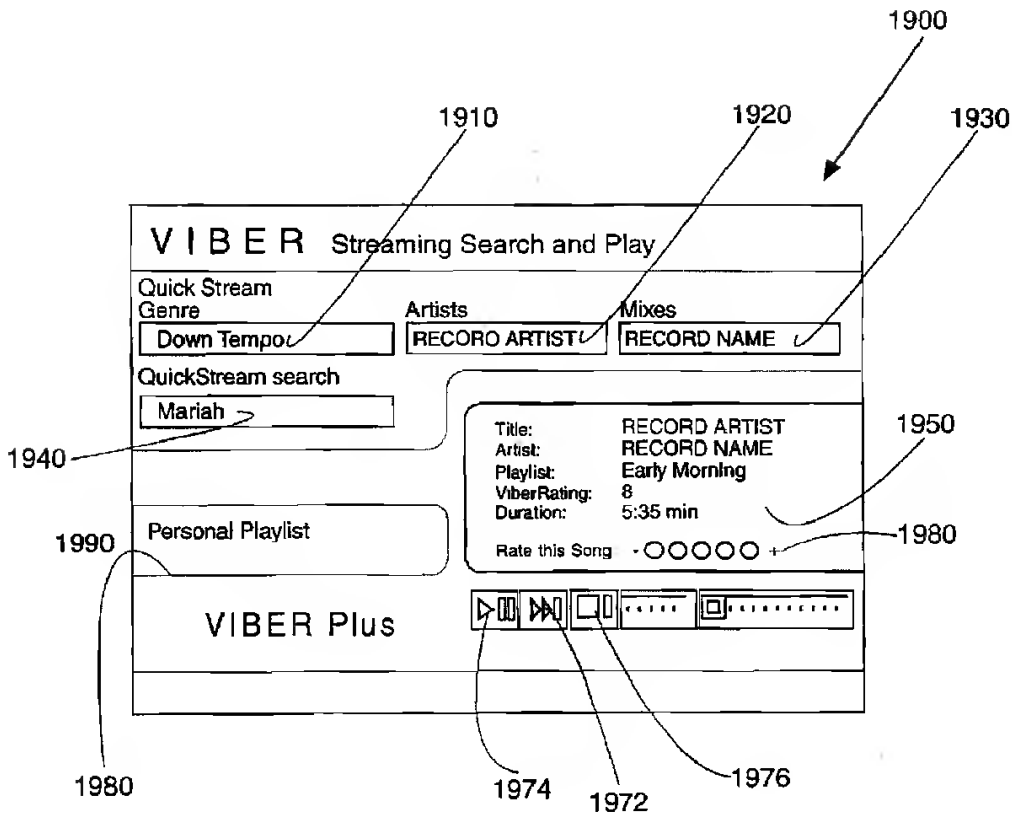

FIG. 21

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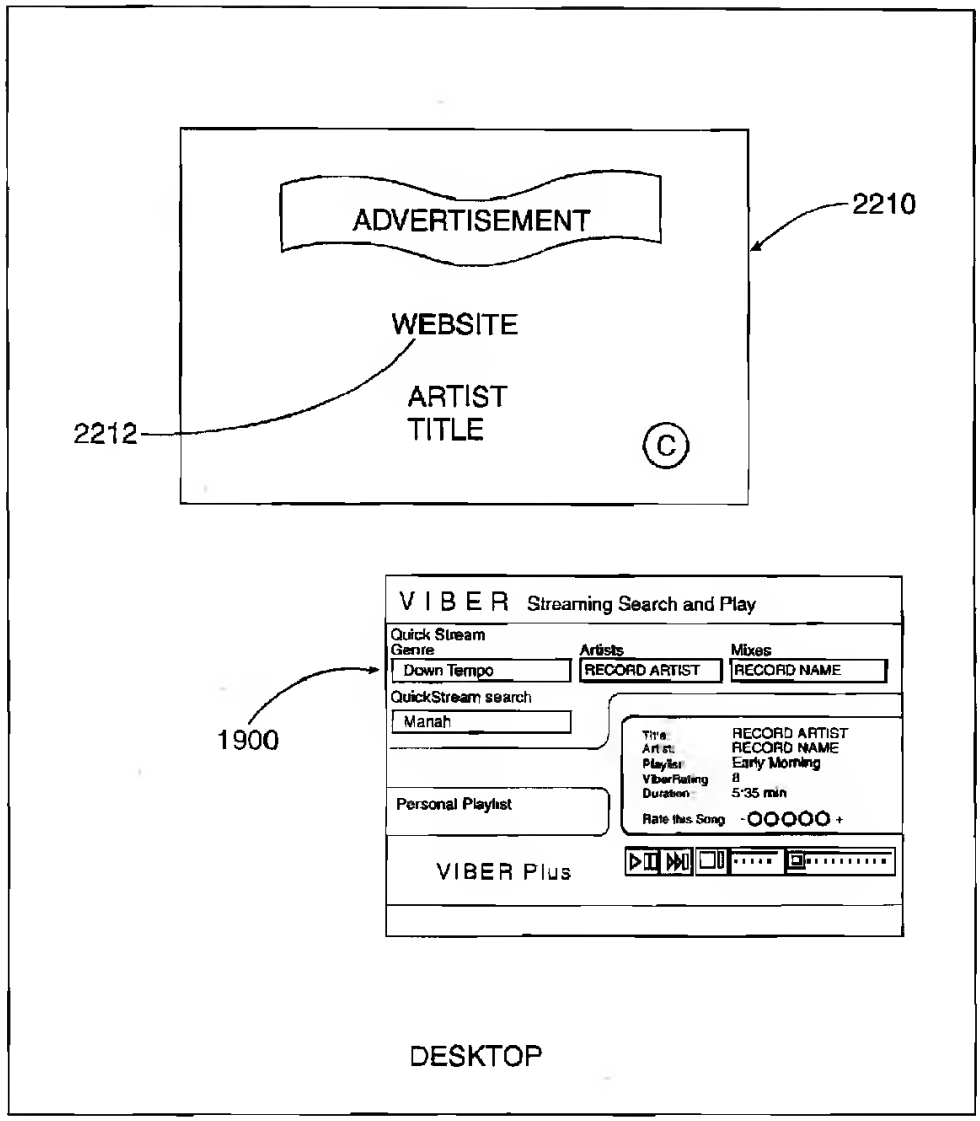

FIG. 22

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STREAMING MEDIA SEARCH AND CONTINUOUS PLAYBACK SYSTEM OF MEDIA RESOURCES LOCATED BY MULTIPLE NETWORK ADDRESSES

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation of Provisional Application No. 60/177,786, filed Jan. 24, 2000, now abandoned, and incorporated by reference herein.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to the field of streaming media content search and playback over a network. In particular, the invention relates to a computer system that enables a continuous streaming media playback from a distribution of sites available over a network such as the Internet.

2. Description of the Related Art

Computers currently can access streaming media on the Internet. Streaming media available on the Internet include, for example, music, video clips such as movie trailers, home movies, and animation.

Users locate streaming media on the Internet by manually selecting links. Typically, users browse the media sites that contain numerous sub-links. Users sometimes select through a chain of links to locate a desired media on a media link. Once located, the desired media link may or may not contain the desired media.

Some services provide media search engine capabilities. Users may enter a search request for selected media creations by an artist. The media search engine then displays links to categories and/or sub-links of media that are determined to match one or more criteria in the search request set forth by the user. The determination of which links should be displayed in response to the search request is dependent on the algorithm used in by the search engine. Typically, links displayed to users of current search engines are not subject to a determination of the quality or availability of the media associated with the media links. Further, the search results are outputted to the user as a display of links for he user's selection.

Many Internet streaming media outlets provide a limited number of source nodes. The sites can be unreliable when the number of users accessing the site become congested.

SUMMARY OF THE INVENTION

An embodiment of the invention includes a method for playing back media fmm network. The method comprises receiving a search criteria from a network enabled device. The method further includes accessing a database comprising a plurality of network addresses, where the database associating each address with one or more classes of information. Each address accesses a media network resource. The method further includes selecting at least one address in the database using the search criteria, signaling the selected address to the network enabled device, and controlling the network enabled device so as to automatically access and play back the media resource of the selected address.

Another embodiment includes a method for playing back media from a network. The method includes receiving a request for media playback from a network enabled device. Further, accessing a database comprising a plurality of network addresses, where each address accessing a media network resource. The method also includes identifying at least two addresses from the database, signaling each identified address to the network enabled device, and controlling the network enabled device to access and automatically play back the media network resources of each of the signaled addresses.

In another embodiment, a computer system is provided for playing back media from a network. The computer system comprises a network enabled device comprising a media playback component. A database is included that comprises a plurality of addresses, where each address locates a media network resource on the network. The database includes one or more classes of information associated with each address in the plurality of addresses. The system also includes a network server module that is coupleable to the network enabled device and to the database. The network server module is able to receive a search request from the terminal that specifies one or more criterias. The network server module selects an address from the database that is associated with a class of information that matches the search criteria. The network server module signals the address to the network enabled device to cause the device to access the media network resource, and to signal media playback component to load the media network resource after the device accesses the media network resource.

In another embodiment, a computer system is provided for playing back media from a network. The computer system includes a network enabled platform comprising a media playback component. A database includes a plurality of addresses, where each address locates a media network resource on the network. Each address accesses a media network resource. The embodiment further includes a network server module coupleable to the network enabled device and to the database. The network server receives a request for media playback from the network enabled device, selects multiple addresses from the database, and signal the multiple addresses to the network enabled device. The network server module control a media playback component on the network enabled device to use the addresses to automatically access and play back the media network resource associated with the addresses.

In another embodiment, a network enabled device is configured to playback media from a network. The network enabled device is coupleable over the network to a database that includes a plurality of addresses. Each address locates a media network resource on the network. The network enabled device includes a user-interface to prompt for a search request. The network interface signals the request to a network server module that is communicatable with the database, and receives one or more addresses in the database that match the search request. The network enabled device includes a media playback component that is configured to be programmatically controlled by the network server module to automatically load the media network resources located by the addresses that match the search request.

In another embodiment, a network enabled device is configured to playback media from a network. The network enabled device is coupleable over the network to a database comprising a plurality of addresses. Each address locates a media network resource on the network. The network enabled device comprises a user-interface including a plurality of user-interactive features, including a first user-interactive feature that prompts to receive a search request for media playback. A network interface signals the request to a network server module upon the first user-interactive feature receiving the search request for media playback. The

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network interface is communicatable with the database to receive one or more addresses in the database that match the search request. A network playback component is configured to be programmatically controllable by the network server module to automatically load the media network resource associated with each address signaled to the network enabled device upon accessing the media network resource. A playback of the media playback component being controllable by one or more control user-interactive features.

An embodiment includes a system that provides media from a network to a terminal having a media playback component. The system includes a first network site and a second network site, where each network site locates one or more media network resources. Each media network resource is locatable on the network by a corresponding address that accesses the media network resource. A network server module is coupleable to the terminal through the network. The network server module identifies a first media network resource from the first network site and a second media network resource from the second network site. The network server module signals the corresponding address of the first media network resource to the terminal with control signals to cause the playback component to automatically load the first media network resource. The network server module automatically signals the corresponding address of the second media network resource to the terminal with control signals to cause the playback component to automatically load the second media network resource.

Another embodiment provides a media playback system for the Internet. The system includes an end terminal having a media playback component. A web server module is coupleable to the end terminal through the Internet. The web server module has access to one or more media web resources on a first web site, and to one or more media web resources on a second web site. The web server module signals a first link to a first media web resource on the first web site, and a second link to a second media web resource on the second web site. The web server module provides control signals to the end terminal to cause the end terminal to access and load the first media web resource and the second media web resource into the media playback component.

One or more of the embodiments may include a database that stores links to each of the plurality of media web resources, the web server module identifying the first link and the second link from the database.

Another embodiment includes a media playback system for the Internet. The system includes a terminal having a media playback component and a user-interface. A web server module is coupleable to the user terminal through the Internet. The web server module has access to a plurality of links, where each link locates a media web resource. The plurality of links are accessible on a plurality of web sites. The web server module signals the plurality of links to the user terminal in a designated order to cause the terminal to load the media web resource located by each of the plurality of links into the media playback component. The embodiment also includes a database that stores the plurality of links. The database is accessible to signal the plurality of links to the web server module in the designated order. The user-interface signals one or more inputs from a user to the web server module. The one or more inputs direct the web server to alter the designated order in which the database signals the plurality of links to the web server module.

Another embodiment includes a system that provides media play-back on a network. The system includes a terminal that is coupleable to the network. A play-list module is coupleable to the terminal. The play-list module stores a first play-list signaled from the terminal. The first play-list includes a plurality of network addresses. A first network address locates a first media network resource on a first network site, and a second network address locates a second media network resource on a second network site. A network server module is coupleable to the terminal and to the play-list module. The network server module signals the first play-list to the terminal. The network server module controls the terminal to cause the terminal to access the media network resource associated with each network address in the first play-list, and to automatically load each respective media network resources into the media playback component.

Another embodiment includes a method for providing media to a terminal coupled to a network, where the terminal includes a media playback component. A terminal is programmatically directed to access a first network site in the plurality of network sites. The media playback component on the terminal is caused to automatically load a first media web resource located at the first network site to playback a first media. The terminal is programmatically directed to access a second network site in the plurality of network sites. The media playback component on the terminal is caused to automatically load a second media web resource located at the second network site to playback a second media.

Another embodiment includes a method to provide media to a terminal coupled to the Internet. A database is accessed that stores a plurality of links, where each link opening a corresponding media web resource. A first link is selected from the database, the first link being located on a first network site. Next, a second link is selected from the database, the second link being located in a second network site. The second network site is external to the first network site. Then, the selected links are signaled to a media playback component on the terminal to sequentially access the media web resources associated with the selected links. The media playback component on the terminal is automatically signaled to load each of the media web resource accessed from the selected links so as to playback a media corresponding to each media web resource.

Another embodiment includes a system to share media playback from a network between a plurality of terminals. The plurality of terminals include a first terminal and a second terminal. The system includes a play-list component locatable on the network by a selectable link. The play-list component identifies a plurality of links to form a play-list, where each link in the play-list locating a media file on the network. The system includes a network server module that signals the plurality of links that form the play-list to the first terminal. The network server module receives a signal to transmit the selectable link to a second terminal to enable the second terminal to locate the play-list module.

In another embodiment, a method is provided to locate web resources on the Internet. A web site is accessed to identify a plurality of links using a web browser component. The web site can be automatically or programmatically accessed. Each of the plurality of links are selectable to open a corresponding web resource of a specified data type on the web site. The plurality of links are made available to a plurality of Internet enabled devices that select one or more of the links.

Another embodiment includes a system to locating web resources on the Internet. The system includes a web browser component, and a database. A search module con-

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trols the web browser component to access at least one web site. The search module controls the web browser component to identify a plurality of links to media web resources at the web site, Each of the plurality of links are selectable to open a media web resource. The search module stores the plurality of links in the database.

Another embodiment includes a method to locate web resources on the Internet. A database that stores a plurality of links is accessed, the plurality of links being selectable to open a corresponding web media resources. Metadata information is programmatically identified about the web media resource corresponding to each of the plurality of links. The plurality of links are made accessible to a plurality of Internet enabled devices. The plurality of Internet enabled devices elect one or more of the links to open the corresponding media web resource.

Another embodiment includes a method to locate web resources on the Internet. A database is accessed that includes a plurality of links to media web resources. Each of the plurality of links are programmatically verified to open a corresponding web media resource. Each verified link is accessible to a plurality of Internet enabled devices that select one or more of the links to open the corresponding media web resource.

Another embodiment includes a system to locate web resources on the Internet. The system includes a first indexed data structure comprising a plurality of links. A media playback component is coupleable to the database. The media playback component loads each of the plurality of links to verify whether the link is selectable to open a media web resource. A second indexed data structure stores each verified link in the plurality of links. The second indexed data structure is available to the plurality of Internet enabled devices.

Another embodiment includes a method to providing links for use in a media search engine. A plurality of internal links on a network site are identified. The network site makes a network resource of a specific data type accessible for a network enabled device. The internal links that are selectable to open the network resource of the specific data type are extracted. The external link is stored in a database. One or more of the links are automatically signaled to a media playback component in response to receiving a search requests from the network enabled device.

Another embodiment includes a method to provide links for use in a media search engine. The method includes a) receiving from a first indexed data structure a first external link to a first network site, b) initializing a second data structure to be empty; c) determining if the first network site contains at least one internal link; d) storing the at least one internal link contained on the first network site that is not in the first indexed data structure and not in the second indexed data structure as another external link in the first indexed data structure, e) identifying the internal links contained on the first network site that are selectable to open a network resource of a specific data type or types; f) moving the first external link from the first indexed data structure to the second indexed data structure, and g) repeating steps a) through f) until the first indexed data structure is empty.

Another embodiment includes a computer system to search for links to streaming media playback on a network, the network being accessible to a network enabled device. The system includes a metacrawler to locate one or more media sites in directories containing streaming media. A media search module coupled to be signaled the one or more directories from the metacrawler. The media search module identifies a plurality of media links for the media sites. Each of the plurality of media links are selectable to open streaming media network resource. A metadata extraction module accesses each media link identified by the media search engine to extract metadata about the identified media link. A database comprising the plurality of media links identified by the media search engine, and the metadata is extracted about each identified media link. The database enables the network enabled device to access the plurality of media links.

An embodiment includes a rating system for rating media network resources on a network that is coupleable to a plurality of terminals. The rating system includes a database having a plurality of addresses. Each address locates a corresponding media network resource on the network. A network server module is coupleable to the plurality of terminals. The network server module accesses the database to signal one or more addresses from the database to the plurality of terminals. A rating module is coupleable to the plurality of terminals. The rating module receives a rating input from each of the plurality of terminals. The rating module associates the rating input with a selected address in the database.

In another embodiment, a rating system is provided to rate media network resources on a network. The rating system includes a database comprising a plurality of addresses that each locate a corresponding media network resource on the network. The database includes one or more classes of information associated with each of the plurality of addresses. A network server module is coupleable to the plurality of terminals. The network server module communicates with each of the plurality of terminals to receive a search request. The network server module signals the database to retrieve one or more addresses from the database in response to the search request. The retrieved addresses are associated with a class of information matching the search request. A rating module is coupleable to the plurality of terminals. The rating module receives a rating input from each of the plurality of terminals. The rating module associates the rating input with a selected address in the database.

Another embodiment includes a rating system for rating media network resources available over a network. The media network resources are located on the network by a plurality of terminals. The rating system includes a database that stores a plurality of addresses. Each address locates a corresponding media network resource on the network. The database includes a rating associated with each of the plurality of addresses. A network server module is coupleable to each of the plurality of terminals. The network server module accesses the database to signal one or more addresses from the database to the plurality of terminals. A rating module is coupleable to each of the plurality of terminals. The rating module receives a rating input from one of the terminals for each of the plurality of addresses in the database. In response to receiving the rating input from one of the plurality of terminals for a selected address in the database, the rating module accesses the database and reconfigures the rating associated with the selected address. A play-list module accesses the addresses to select one or more combinations of addresses. The play-list module signals the play-list to the network server module as addresses to be signaled to one or more of the plurality of terminals.

In a variation, the address may be selected by the play-list module based on a criteria stored with the address in the database. Examples of criterias include rankings, reflecting preferences of users on terminals after playing back media

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located by the respective addresses. Other criterias that can be used to select addresses include metadata information, such as artist name and media title. For example, the search request may specify a ranking as one of the criterias. The play-list module then sorts the database for the ranking in selecting the addresses.

Another embodiment includes a method for ranking media sources on a network. The method includes accessing a database that stores a plurality of addresses. Each address locates a media resource on the network and each address is associated with a rating. A selected address from the database is signaled to a terminal coupled to the network. A rating input is received from the terminal after signaling the selected address to the terminal. The rating is associated for the selected address is adjusted in response to receiving the rating input.

Another embodiment includes a method for ranking media sources on a network. A database is accessed that stores a plurality of addresses. Each address locates a media resource on the network and each address is associated with a rating. A combination of addresses are selected to form a play-list. The play-list is signaled to a terminal coupled to the network. A ranking is received from the terminal after signaling the addresses in the play-list to the terminal. The rating is adjusted for each address signaled to the terminal from the play-list in response to receiving the ranking.

Another embodiment includes a method that ranks media sources on a network. A database that stores a plurality of addresses is accessed. Each address locates a media resource on the network, and each address is associated with a rating. A selected address is signaled from the database to a terminal coupled to the network. A ranking is received from the terminal after the selected address is signaled to the terminal. The rating associated for the selected address is adjusted in response to receiving the ranking.

Another embodiment includes a network enabled device that comprises a media playback component. The media playback component is configured to communicate with a network-side module to receive a first plurality of links. Each of the first plurality of links locate a media file on a network. A web browser component is configured to receive a second plurality of links. Each of the second plurality of links hosts a media file located by one of the first plurality of links. The web browser component displays the web site for each of the second plurality of links when the media playback component plays back media from the media file being hosted by web site being displayed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a flow process describing an embodiment of the invention.

FIG. **2** is a block diagram illustrating an architecture for use with an embodiment of the invention.

FIG. **3** is a block diagram illustrating a back end architecture, under an embodiment of the invention.

FIG. **4** is a block diagram illustrating a media search and playback system, under an embodiment of the invention.

FIG. **5** is a block diagram illustrating components on an end terminal receiving control information from a server-side module, under an embodiment of the invention.

FIG. **6** is a flow chart illustrating a system for forming a search database of media resources accessible on a network, under an embodiment of the invention.

FIG. **7** is a flow chart illustrating a system for forming a search database of media resources accessible on a network, under an embodiment of the invention.

FIG. **8** is a flow chart for verifying records in a search database of media resources, under an embodiment of the invention.

FIG. **9** is a flow chart for extracting metadata about a media resource associated with a site on a network, under an embodiment of the invention.

FIG. **10** is a flow chart for forming play-lists for end users of a system under an embodiment of the invention.

FIG. **11** is a flow chart for receiving user input in response to playing back media resources from a search database, under an embodiment of the invention.

FIG. **12** is a block diagram of a media playback system including a rating feature, under an embodiment of the invention.

FIG. **13** is a flow chart describing user input to a user interface for a media playback system, under an embodiment of the invention.

FIG. **14** is a flow chart describing a rating system, under an embodiment of the invention.

FIG. **15** illustrates an exemplary structure for a database to maintain updated records on ratings for addresses containing media resources, under an embodiment of the invention.

FIG. **16** is a flow chart for creating play-lists using rating information, under an embodiment of the invention.

FIG. **17** is a flow chart for programmatically categorizing media files, under an embodiment of the invention.

FIG. **18** is a flow chart for creating personalized play-lists of streaming media files available in a network, under an embodiment of the invention.

FIG. **19** illustrates a distributed playback architecture, under an embodiment of the invention.

FIG. **20** illustrates a block diagram of a messaging application, under an embodiment of the invention.

FIG. **21** illustrates a user-interface for use with a media search and playback system, under an embodiment of the invention.

FIG. **22** includes another user-interface displaying an instance of the web browser while media is being played back, under an embodiment of the invention.

DETAILED DESCRIPTION

A System Overview

According to an embodiment, a system is provided comprising a media search engine. The media search engine may be used to create a database of links to media files. The links may be structured according to predefined categories and/or user-defined search criteria. A client terminal includes a media player to automatically access one or more media files using the corresponding links. The media player then plays back media contained on the media files.

Among other advantages of the invention, the user terminal accesses media files at various sites on a network, without requiring users to manually select media links. For example, user terminals may output music to a user by automatically accessing one or more Internet sites containing media files. The music is outputted without requiring users' to view and select links to sites containing the media.

In contrast to embodiments of the invention, using other systems to search for Internet files containing media can be a distracting and time-consuming experience for an end user. In many instances, such a search will yield a series of links on a directory or web search page. A user may have to click on each individual link, one at a time, to play each individual media file. The selected media file may be broken and

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unavailable to deliver media content. Even if the number of broken links is not high, the user must still click on the links one at a time to activate each media file, providing at best a stop-and-go experience.

In one embodiment of the invention, a user terminal is able to receive continuous media streaming from multiple sites on the Internet. Multiple sites may be accessible to enable the user terminal to receive streaming media without any interaction required from an end user other than signaling a request to receive streaming media. The user terminal automatically accesses media links containing media using a media playback component.

The media playback component may be controlled by one or more server side modules. In one embodiment, the media playback component on the user terminal interacts with one or more play-lists generated by server side modules. The play-lists contain media links for the media playback application. The media links may be structured or ordered in the play-lists. The play-lists may be generated automatically by back-end modules and/or manually by editors. The play-lists may also be generated by end users.

The media playback component may also interact with one or more server side search modules to access media links on the network. The media links may be automatically selected based on, for example, a search criteria from the end user.

Embodiments of the invention provide a system to search and playback media accessible over a network. In one embodiment, a media search engine is provided to enable users to request media output based on a criteria set forth in a search request. The media search engine is able to efficiently locate streaming media on the network that matches criteria set forth in a search request. The system provides continuous playback of media found on multiple sites of the network. For example, a user may specify a search based on a specified artist. The system locates one or more sites on the Internet containing media files from the specified artist. The system enables the user terminal to automatically and continuously play back media creations available on the Internet sites.

Further, a backend system under an embodiment of the invention minimizes possibilities of broken links and mismatched search results. The backend system may also be used to perform manual and/or programmatic quality check of the media associated with each link.

Further, a search engine under an embodiment of the invention employs an Internet web browser software component on the back-end to perform searches and indexing of web resources. The Internet web browser component may be a configured or modified commercially available web browser component. Server-side modules may combine to control the browser in locating media links and media sites containing media content. As a result, the media search engine under this embodiment is efficiently implemented, using existing resources on the back-end system.

Among other advantages, embodiments of the invention enable streaming media from multiple media links to be automatically played to users. Embodiments of the invention also employ a scalable and distributed architecture. Scalability in this sense means that the service is available to a large (thousands or more) audience of simultaneous listeners or viewers while minimizing bottlenecks caused by congestion. Another advantage of a distributed architecture is that the unavailability of one media site, or of one or more media on the media site, does not preclude the user terminal from receiving media from another site. As a result, users are ensured a continuous listening or viewing experience.

Further, streaming media may be continuously outputted to users from multiple sites on the Internet based on personalized criteria set forth by users. The criteria may be set forth in one or more requests by an end user. The end user may experience media continuously outputted from multiple sites, based on only one request from the end user. This allows a user to request media through actions such as clicking requests through a user-interface.

An embodiment of the invention enables users to share streaming media experiences with other end users. For example, users may share play-lists containing links to multiple Internet sites. This enables individuals to create media programs of streaming media using multiple sites on the Internet. For example, play-lists may be shared among end users using a host web site, or e-mails.

B. Search and Playback System

A user terminal may transmit a search request from an end user to one or more modules on a server. A client side playback module, one or more server-side modules, or a combination of client and server side modules combine to access the user terminal to a site on the Internet that contains media content immediately available for loading and playback. The response to the search request is media output through the user terminal. The media content is outputted from the user terminal without any additional action on the part of the end user after the initial search request. Once media from one site is completed, the playback module automatically enables the user terminal to access and playback media located on another Internet site. As a result, an embodiment enables the user terminal to output continuous streaming media to an end user, where the media outputted is accessed from multiple Internet sites.

Embodiments of the invention may be implemented on the Internet. Other embodiments may be implemented on any network that carries digital information, such as local-area networks (LANs), Wide Area Networks (WAN), Extranets, Intranets, Internet, and wireless networks, or networks utilizing wireless transmissions. An example of a network for use with an embodiment of the invention includes a network operating under a transmission control protocol/Internet protocol (TCP/IP). Embodiments of the invention may also be employed on proprietary WANs, such as America Online™. Thus, discussion of embodiments employed on the Internet are exemplary, and equally applicable to other types of networks described above.

A system for use with an embodiment includes a network enabled device, a network server module and a database. The network enabled device includes a device having components to couple to a network such as the Internet. The network enabled device includes a communication port and processor, and may also include memory and a display. The communication port may be a physical port, such as a connector extending a modem connection. The communication port may also be a wireless port, such as those configured to transmit and receive radio frequency data communications. Examples of network enabled devices include personal computers, handheld devices such as those operating Windows CE™ or Palm™ operating systems, and cellular phones with Internet capabilities such as Sprint PCS™ systems. Other examples of network enabled devices include smart appliances, such as systems including speakers and a processor to receive communications from the network.

The network enabled device may include a media playback component. The media playback component includes an application that plays back streaming media files. Examples of commercially available media playback com-

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ponents include Real Network Player™, Apple Quicktime Player™, and Microsoft Windows Media Player™.

In an embodiment, network server module includes server-side modules that communicate to the network enabled device through the communication port. The network modules may be coupleable to the network enabled device through a network such as the Internet. Alternatively, the network server module may exist on the terminal. The network server module may, for example, access a database on the network from the terminal. Still further, the network server module may exist on both the terminal and on a server on the network. Specifically, the network server module may comprise network-side code, executed on the terminal through a client application. For example, the network server module may includes applets or Java script delivered to the user terminal for execution of processes and functions, as disclosed herein.

The database stores a plurality of addresses. Each address locates a media network resource. The media network resource includes files that can be loaded into the media playback component to output media. As used herein, media refers to a combination of audio and/or video. Video media may include a collection of images assembled together in an animated fashion to resemble motion or action. Examples of video media include movie clips, recordings from video recorders, and animation such as cartoons. Still further, media may include a collection of still images and graphic presentations that are combined with audio media. Other examples of media include dynamic or animated pictures or text on a web page.

In one implementation, the media files may be loaded and played back to output music or music videos. As another example, media files may include video or animation with story-lines, plots, characters and resemble conventional television or radio programming. Other examples include movie clips, home movies, movie trailers, or highlights from sporting events.

As used herein, a module includes a program, a subroutine, a portion of a program, a software component or a hardware component capable of performing a stated task or function. A module can exist on a hardware component such as a server independently of other modules, or a module can exist with other modules on the same server or client terminal, or within the same program.

The network server module is coupleable to the network enabled device to exchange communications, and to access the database. The network enabled device provides a search request, including a search criteria. The search criteria includes any condition specified by the user to identify some of media files from other media files in the database. Examples of search criterias include titles, artist names, data types, user preferential ratings, quality, and duration.

The network server module selects at least one address from the database based on the search criteria. The identified addresses are signaled to the network enabled device. The network server module may communicate with the media playback component to cause the media playback component to playback the media resource located by the address.

FIG. **1** illustrates a process for use with a system to search for and playback Internet streaming media, under an embodiment of the invention. In one application, the process is performed on architectures described and illustrated with FIGS. **2** and **3**. While the process is described with reference to an integral system, one or more steps described with FIG. **1** may be performed independently of other steps. Similarly, components and modules used to perform steps in FIG. **1** may also be implemented in different systems and architectures. Further, steps mentioned with FIG. **1** may be performed concurrently with one other, or in an order different than shown in FIG. **1**.

In step **110**, a system builds a database of addresses. An address may include a Universal Resource Locations (URL) for network and Internet sites. A media site include, for example, a web site that allows web users to access streaming media. In other embodiments, the media site may locate network media resources on other types of networks. The media sites may be located through a media search engine, as described elsewhere in this application. An exemplary process for identifying media sites under an embodiment of the invention is provided with FIG. **4**.

Each media site may provide access to media through one or more media links available at the site or through other means. The media links identify web resources having media content. These web resources may include a file of arbitrary type. Examples of file types include Multipurpose Internet Mail Extension (MIME) types such as MOV, JPEG, or RAM. The file is available for loading, browsing or playback on the World Wide web. Each media link may be either an internal or external link relatively to that particular media sites. An internal media link on a web-site may correspond to a URL that identifies a web resource located on the web domain, host, property or server of that site. An external media link on a media site identifies a web resource that is not located on web domain, host, property or server of that media site.

In step **120**, the system identifies and stores in a database media links (URLs) for each media site. An exemplary process for identifying and storing media links on individual media site stored in a database of media site is provided with FIG. **5**.

In step **130**, each media link is verified. The media link is verified to contain media that is available for playback for users. Thus, broken links, inoperational or unavailable media are precluded from being verified.

In step **140**, metadata information is extracted from each media link. Preferably, metadata information is extracted from each verified media link. In an embodiment, metadata may also be added to a list or database of extracted metadata. Additional metadata may be added using, for example, manual interactive editing and an editor interface (see for example, editor interface module **275** in FIG. **2**). Examples of metadata information include (with an exemplary data structure type associated with each media link in parenthetical): identification (Integer), author (String), duration (String), media URL (URL), source web site (URL), media type (Integer), rating (Real number), number of votes (Integer), verification status (Boolean), edited status (Boolean), genre type (Index into a genre database table), play-list genre status (Boolean), mix (index into mixes database table), play-list mix status (Boolean), mood (index into moods database table), description (String), clip broadcast quality (integer), image size for videos (integer, integer), and play-list mood status (Boolean). One or more of these types of metadata may be extracted from the media links or from the actual media file. For example, a media link to a web resource may be extracted for identification, duration, author, and source web site. Similarly, one or more of these types of metadata may be added to the extracted metadata information. For example, genre type and description information may be added to the extracted metadata information.

In step **150**, the system creates media play-lists using media database for predefined categories. In an embodiment, verified media links are structured into play-lists, such as described with FIG. **10**.

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In some embodiments, links to streaming media commercials may be inserted into the play-lists in various locations between media clips. These commercials are targeted to the audience likely to listen to the media available on the play-list. The commercial may be produced and broadcast from distributed sources, or from web server module. Other examples of streaming media that can be included with play-lists includes news items and weather reports.

In step **160**, a playback interface is provided. The playback interface causes the media player component on the user terminal to play media associated with media links in each play-list. The playback interface may include features to manipulate play-lists, or to switch between play-lists. For example, the playback interface may allow for a user to skip media or web resources until a preferred media or web resource is located. The playback interface is a software or hardware application that is executed on the user terminal. The playback interface may be packaged as a web application, dynamically accessible through a web server module, or be packaged as a desktop software application.

In an embodiment, a playback interface module includes a streaming media clips rating system that allows users to rate each clip as it is played back. The back-end module rating system uses these votes to generate rated play-lists that are available through the playback Interface for playback.

Further, the playback interface module may include a system to allow users to send Internet e-mail notifications to one or more e-mail addressees regarding a media clip, or to send continuous streaming media programs containing multiple media clips from multiple network sources. Recipients may initiate the playback module by selecting one or more links contained in the e-mail. Selecting a link from the e-mail initiates the play back module on that recipient's terminal, causing the play back module to play back the media clip or the programming referred to by the sender.

The playback interface includes user interface elements that allow users to define and execute search criteria for media playback.

FIG. **2** is a block diagram illustrating an architecture of a system **200**, under an embodiment of the invention. The system is shown to link a user terminal **210** with media that is accessible on the Internet **220**, including the World Wide web **215**. Other embodiments of the invention may operate with different types of networks.

The user terminal **210** includes any network enabled multimedia computing platform. In particular, user terminal **210** includes any Internet enabled multimedia computing platform. Examples of computing systems for user terminal **210** include personal computers (PC), personal digital assistants (PDA), smart phones, and Internet enabled televisions and radios, and other devices. The multimedia capability is manifested in the availability of a steaming multimedia playback software and or hardware component. Internet enabling means that the platform can access information over the Internet. In an embodiment, user terminal **210** runs the media location and playback interface module **270** that is accessible over the Internet. A communication channel **212**, such as a phone line, wireless medium, or DSL line, is used to couple the user terminal **210** to the Internet. Alternatively, the playback module may be preinstalled on the client terminal. Under both configurations the playback module access media play-lists that are stored on an Internet web server.

A back-end database management system **245** is provided to maintain information used in providing media searching and playback to user terminal **210**. The database management system **245** receives information from modules, including server-side modules that communicate with user terminal **210**. In an embodiment, modules used to provide media search and playback capabilities to user terminal **210** include a media search module **230**, an automatic verification and extraction module **255**, an editor module **250**, a play-list generator module **260**, and a web server module **270**. The modules may communicate with an interface of user terminal **210**.

Under an embodiment, this communication is implemented using media play-lists on the web server module **270**.

The modules may also communicate with software applications or components on the user terminal, such as a web browser application or a Streaming Media player component in a manner that will be described below.

In an embodiment, media search module **230** includes a media directories meta-crawler module **234** and a media search engine **238**. The meta-crawler module **234** and the media search engine **238** may be operated independently and concurrently of one another. The meta-crawler module **234** conducts a general search of the Internet **220** to locate media sites. Media sites may include web pages that are likely to contain web resources, media links to web resources, or links to other web pages that have such media links and/or web resources. The meta-crawler module **234** adds the address or location of each found media site to a media site table **243** maintained by database management system **245**. The media site table **243** may list media sites that identify a URL for each web page located by meta-crawler **234**.

In one embodiment, the entire media site table **243** is programmatically generated by meta-crawler module **234**, without any manual or interactive human input. In other embodiments, an editor module **232** may interface with database management system **245** to manually input a URL for one or more of the media sites into the media site table **243**. Another embodiment may substitute editor module **232** for meta-crawler **234**, so that the media subdirectory manually receives a URI for each media site.

The media search engine **238** accesses the media site table **243** maintained by database management system **245**. The media search engine **238** identifies media links to web resources on each media site provided in the media site table **243**. In an embodiment, media search engine **238** contacts each site in the media site table **243** to locate media links. The media search engine **238** then stores the addresses of each media link in the database management system **245**. In an embodiment, a URL of each media link is stored in a portion of a media and metadata table **247**.

An automatic media verification and metadata extraction (AMVME) module **240** accesses the portion of media and metadata table **247** that contains URLs to the media or media links. The AMVME module **240** verifies each media link in media and metadata table **247**. The media links are verified to contain web resources matching a criteria defining media. For example, each media link may be verified to contain a combination of audio or video, rather than be only a text document. In addition, the media links are verified as available for playback by users, to avoid broken or old links being maintained by database management system **245**.

The AMVME module **240** also extracts metadata from the web resource associated with each media link in the media and metadata table **247**. Preferably, AMVME module **240** extracts metadata from verified media links. The AMVME module **240** may automatically visit each media link on the Internet to extract metadata information, as well as verification information. The metadata extracted pertains to infor-

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mation available from the web resource or about the web resource on the media link. Examples of metadata that may be extracted by media extraction module **255** include information such as the author, duration, name, description text, broadcasting and playback quality of the media content and frame size and display resolution for images, video and home movie clips. For example, a media link may be associated with a web resource that is an audio media. Metadata that may be extracted from the media creation may include the artist name, the name of the media creation, length and audio/video quality. In an embodiment, media extraction module **255** also verifies that the media is available for playback from the media site. The AMVME module **240** may accesses database management system **245** to store verification and metadata information in media and metadata table **247**.

In an embodiment, a metadata editor interface **275** is included in the system **200**. The metadata interface **275** accepts manual entry from an editor pertaining to metadata of the web resource associated with each media link. The metadata interface module **275** may access one or more media links in the media and metadata table **247** to allow manual inspection of each web resource for metadata information. An editor operating metadata interface module **275** transmits a media streaming request to have the media of the web resource replayed for inspection on a terminal. The metadata editor interface **275** then allows for additional metadata to be stored in media and metadata table **247**. Preferably, the additional metadata information includes metadata that is not programmatically available from the media link containing the web resource. For example, metadata editor interface **275** may be used to add information to media and metadata table **247** information such as genre of the web resource, description of the web resource, and system predefined information, such as mood and mix, that are found applicable by the editor to the web resource.

A play-list generator module **260** generates a plurality of play-lists based on information in the database management system **245**. In an embodiment, play-list generator **260** accesses media and metadata list **247** for URLs to media contained on stored media links. The play-list generator module **260** may create play-lists **284** from predefined categories characterized by information stored in the database system for media links and metadata stored in table **247**. Play-lists **284** are stored on web server module **270**.

Under one embodiment, the web server module **270** includes a media location and playback application. The user terminal **210** interfaces with the media location and playback application through the Internet. For example, web server module **270** makes the media location and playback application available on a web site. The user can launch the media location and playback application by clicking a link on the web site. Under another embodiment the playback application is pre-installed on the user terminal.

The playback application accesses the web server module **270** to load media play-lists that are stored on it. In an embodiment, the playback application reads Media URLs and Metadata stored in one or more play-lists. This information is used to playback continuous media from the play lists to the user. A web page or network site hosting the media file being played back may also be displayed as an instance of a web browser on the network enabled device. For example, audio media may be played back while the user is presented with a web page hosting the audio playback (see FIG. **22** and accompanying disclosure).

The media location and playback application may output or playback media processed by the back-end system and stored in the media and metadata table **247** upon receiving a request from user terminal **210**. For example, under an embodiment, music may be outputted from user terminal **210** continuously in a manner that resembles a jukebox, Disk Jockey Mix or a radio station.

An interface of the user terminal **210** enables users to skip playback of media clips, or to switch categories. For example, a user on user terminal **210** may select to hear Jazz programming, and then switch to a genre of classical music. One or more features of a user-interface may be used to enable users to make selections (see FIG. **21** and accompanying text). The user may also control playback settings such as volume, pause, seek and retrieve additional media clip information, skip songs, or replay certain songs being automatically played. The user may also control and/or customize the creation of play-lists using the interface. For example, one musical play-list may include a combination of genres, such jazz and classical songs.

In an embodiment, the media location and playback application programmatically controls a streaming media multimedia software or hardware component to perform the actual streaming of the media digital bits to the user terminal's multimedia output device (such as video display and speakers hardware). The media location and playback application contains functionality that responds to software events generated by the streaming media component. For example, a playback error generated by the streaming component may result in the application instructing the component to play another media file. In another example, the application determines and initiates playback of a media clip in response to the component reporting that the currently playing media has finished. The application may contain user interface elements that allow users to issue media playback commands. These commands are dispatched by the application to the component that implements the playback command for the currently played media.

In an embodiment, the media location and playback application works in combination with functional commands provided to the user via a web based software application. A user-interface may be provided to enable the user to select the function commands at the software application. An example of a user-interface is provided below, with FIG. **21** and accompanying text.

In an embodiment, a categorization module **290** accesses media and metadata table **247** to add metadata and to categorize media associated with media links in media and metadata table **247**. The automatic process generates metadata such as music genre by consulting with information stored in other records in media and metadata table **247**. For example, the module can automatically set the genre metadata information for all media creations available in the table, for a given artists, according to genre metadata entered for one or more media creations by the same artists. This process greatly contributes the efficiency and scalability of the back-end system.

FIG. **3** is high-level system software components diagram for the system **300**, under an embodiment of the invention. The diagram shows how software components may be written, deployed and interact to provide the functionality described by system **200**. The components of system **200** may be described as a three-tier architecture. Components are written to spec and deployed to a backend tier, a middle tier, and a front tier. The backend tier includes the database management system **245**. The database management system **245** includes a database **345** and a backend interface module **355**. The backend interface module **355** may be provided with, for example, a Microsoft SQL Server system (MS SQL).

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The middle tier includes modules that communicate with backend interface module **355**. The middle tier may include a media sites manager **360** and a media manager **365** software components. The media sites manager **360** and the media manager 365 each independently communicate with backend interface module **355**. The media sites manager **360** components exposes a programmatic interface **362** to communicate with modules and components in the front tier. The media manager **365** includes a first media manager interface **366** and a second media manager interface **368**.

The front tier includes a media site module **330** and a media module **340**. The media site module **330** communicates with site interface **362**. The media site module **340** communicates with the first and second media manager interfaces **366** and **368**. The first and second media manager interfaces **366** and **368** communicate with the media module **340**. The media site module **330** includes a front-end interface **332** to a directory meta-crawler **310** and a media search engine **312** modules. The media site module **340** includes a front-end interface **342** to the media search engine **312**, an editor interface module **314**, and an automatic verification module **316**. The directory meta-crawler **310** crawls Internet media directories web sites. The links to media web sites are handed over to the MediaSite module **330** for storage in the database. The media search engine **312** searches for media links on web sites provided by the MediaSite module **330**, these links are transferred through Interface **342** on the Media module **340** for storage in the database module **345**.

The editor interface module **314** obtains media link for editing from the Media module **340**, using Interface **342** and loads the media for editorial playback from the Internet. The editors provide metadata for media that are added to the database by the Media module **340**.

The verification module **316** examines media files or web resources accessed through each media link and updates metadata regarding media availability in the database using Media module **340**. This module also extracts metadata from Internet media and updates this in the database using Media module **340**. The module queries the database for a batch of media records using the Media module **340** and automatically verifies and extracts metadata for the Internet media represented by these records.

With respect to communications from the backend tier to the front-end tier, database management system 345 of the backend tier provides records to the system **300**. Each record or record set is disconnected from tables or databases of record(s). Disconnected records are transmitted from the backend tier to the front-end tier as active database objects (ADO) Disconnected record sets.

With respect to communications from the front-end tier to the backend tier, each disconnected record can be updated in the database by any components on any tier. Updated records are transmitted to the database management system **345** in the form of record set update operations. In an embodiment, directory meta-crawler **310** sends URLs to be added to records in database **345** to media site module **330** using an asynchronous method calls. The media search engine 312 transmits to media site module **330** using a get search method call for batch sites of URLs. The media search engine **312** uses an asynchronous method call to add media links and metadata associated with media links.

The components and all tiers expose programmatic interfaces that contain callable methods using the MS DCOM (distributed component object model) software component technology. Communication between the tiers is also implemented using method calls on these components. The components are deployed in front, middle and back tier hardware systems. Alternatively, The components may be developed and deployed using the MS COM+ components technology. Using this technology, a COM+ In Memory Database system (IMDB) proxies and caches tables of the back-end database module 245. This process speeds up the search and editorial process. COM+ services such Queued Components may used to implement asynchronous method calls exposed on Interfaces 362 and 366.

C. Media Search Engine

Embodiments of the invention locate web resources on a network such as the Internet. In one embodiment, a network browser identifies a plurality of links to one or more network sites. The links are each selectable to open a network resource of a specified data type. The identified links are then made available to network enabled devices that can select one or more of the links.

As used herein, a network browser is software that performs core functions that include (i) loading network resources; (ii) parsing, translating and laying out network resources, and (iii) displaying the network resources. The network browser includes an application programmable interface (API). An embodiment of the invention employs the network browser on a back end to locate the network resources of the specified data type. One advantage of this embodiment is that the web browser is employed on the back end programmatically, rather than through manual interaction with an editor or other user.

A network browser may include a shell, an API, and a processing module. A component of the network browser includes the API and the processing module. For Internet applications, the processing module may include, for example, a MSHTM or DLL module. The network browser component performs functions that include loading a network resource, as well as parsing, translating, and laying out the network resource.

In an Internet application, a web browser component may be used to locate resources of a specified data type. The web browser component may be a portion of a commercially available browser. For example, the web browser component for use with an embodiment of the invention may be a reconfigured Netscape Navigator™ or Internet Explorer™ browser.

In an embodiment, the web browser component is programmatically controlled through the API of the web browser to access the web resource for the plurality of links. The web browser may be programmatically controlled to bypass the shell of the web browser. For example the API may be used to instruct the web browser to ignore the shell, or to detach the functionality of the shell. The remaining web browser component then identifies the links to the specified data types. The result is that the web browser component accesses the web resources of the plurality of links to identify the data types of the resources on the links while ignoring data such as images and sound.

In another embodiment, a search module controls the web browser component to access a web site. The search module controls the web browser component to identify a plurality of links to media web resources at the web site. Each of the plurality of links identified by the web browser component are selectable to open a media web resource. The search module stores the plurality of links in the database.

In another embodiment, a database includes a plurality of links to media web resources. The plurality of links are programmatically verified to determine whether each link opens a corresponding media web resource. The verified link are made available to a plurality of Internet enabled devices that select one or more of the links to open the corresponding media web resource.

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The links may be verified on the back end using a media player, including a commercially available media player. For example, each link that needs to be verified may be programmatically loaded through an API of the media player. The response provided by the media player to the link determines whether the links are verified.

In another embodiment, the media player may be programmed to identify metadata from the media web resource of each link. The metadata may then be stored in a database associated with the link.

Among other advantages, embodiments enable network links to files of a particular data type to be rapidly accumulated and stored in a database. Each of the links are selectable to open a file on the network. The files may enable a terminal to play back media. In an embodiment, the addresses access media files that can be loaded into the media playback component of the user terminal. The files can be stored in the database with information that characterizes the files associated with the links. Thus, the links may be characterized by, for example, metadata information, and one or more classes of information.

In addition, embodiments enable each link in the database to be programmatically verified, so that there are no broken or unavailable links in the database. Still further, some metadata information may be programmatically identified from each media file. In contrast, existing systems verify links manually, employing interactive users to perform the manual functions. Existing systems also extract metadata information manually.

FIG. 4 illustrates a block diagram in which system **200** receives a search request **203** and provides a response **209**. In an embodiment, system **200** processes the search request **203** using the web server module **270** and the media and metadata database **247**. The end terminal **210** signals the search request **203** to web server module **270**. The web server module **270** accesses the media and metadata database **247** to retrieve one or more URLs matching the search request. The web server module **270** signals the response containing the retrieved URLs to the media playback component **211** of end terminal **210**.

In an embodiment, the search request **203** includes one or more criterias that specify a selection of URLs from media and metadata database **247**. The criterias may correspond to parameters in media and metadata database **247**. The table **249** illustrates a data structure of media and metadata database **247**. The table **249** includes a URL list comprising a plurality of URLs. Each URL provides direct access to a web resource containing media. Each URL is characterized by one or more parameters that correspond to metadata information about the web resource associated with the URL. As an example, table **249** provides parameters as being genre (G), data type (DT), category (C), web resource identity, and one or more play-lists (PLAY1, PLAY2, PLAY3).

The genre data is a broad class identifier of the media creation comprising the web resource of the respective URL. For music, the genre may include rock, classical, and jazz. For movies, the genre may correspond to romance, comedy, horror etc. The genre may be identified either programmatically, or through an editor interface. One genre may be associated with one or more URLs in table **249**. In the example provided, URL1–URL7 are in either one of three genres, G1, G2, and G3. Alternatively, several genres may be associated with one URL.

The data type parameter corresponds to the MIME characteristic of the web resource associated with the URL. The category parameter may correspond to a sub-class of a genre. For example, in music, a category may correspond to soft rock. In movies, a category may correspond to the time-period of the movie. The table **249** illustrates an example in which the category is unique to the genre. Thus, a web resource of one genre is not in the same category as a web resource of another genre. As an example, URL1 and URL3 are in the same category, as are URL2 and URL5. However, no other URLs are in the same category.

Other metadata information that may be included in media and metadata database **247** include identifier information. The identifier information identifies the web-resource. The identifier may provide name of a specific media creation, as well as an artist or author of the media creation.

In an embodiment, media and metadata database **247** includes play-list information as parameters of metadata information. The play-lists may be identified in any one of several ways. For example, the play-lists may be identified by a unique name or other identifier. The play-lists may be identified by another parameters, such as genre or category type. A Boolean data type may be associated between each URL and each play-lists.

The criterias of the search request **203** specify one or more parameters to media and metadata database **247**. For example, search request **203** may include criterias corresponding to one or more of a genre, category, play-list, or identifier. In an embodiment, web server module **270** accesses media and metadata database **247** for URLs that have all of the parameters set forth in the search criteria.

The web server module **270** retrieves the URLs matching the criterias of the search request. The response **209** is signaled to the media play-back component **211**. The response includes one or more URLs. It is noted that when play-lists are requested, additional URLs multiple play-lists are provided. The response **209** may also include metadata information. For example, the response **209** may signal to end terminal **210** the duration of the web resource for each URL, the artist, the history, etc.

The web server module **270** further signals control information **207** to access the URL provided in the response **209**. The control information **207** causes end terminal **210** to load the web resource for the media playback component **211**. Thus, the media playback component automatically loads the web resources associated with each URL included in response **209**. The experience provided to end user **210** is that media is outputted in response to inputting a search request. This is in contrast to other systems in which the user is provided links to media sites containing web resources matching the search criteria.

As an example, a user may specify a media creation from a specific category. For example, the user may input a search request for "nature sounds". The web server module **210** accesses media and metadata database **247** for parameters that match "nature sounds". In one application, a play-list is located that is pre-programmed to provide URLs to web resources containing nature sounds. The response **209** then comprises one or more play-lists, each containing multiple URLs to web resources containing nature sounds. In another application, a category parameter or sub-parameter is searched for "nature sounds". The response **209** may include one or more URLs that are not pre-programmed into play-lists. The response **209** may provide URLs to media playback component **211** one at a time, in groups (such as in play-lists), or all at once.

In an embodiment, categorization module **280** may be used to programmatically create one or more parameters such as illustrated by table **249**. The parameters may be

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determined, by for example, identifying metadata information on the media site hosting the URL.

FIG. **5** is a block diagram illustrating the media playback component **211** being controlled by one or more modules of system **200**, under an embodiment of the invention. The web server module **270** signals control information to an application program interface **276** of the media playback component **211**. The control information may be provided by the media locator and playback application of the web server module **270**. The web server module **270** signals commands, with one or more URLs corresponding to media resources selected to be signaled to the user terminal **210**. As an example, commands from web server module **270** may be instructions that use each URL as an arguments. Examples of commands that control the media playback component include play(URL) and pause (URL).

As an optional feature, web server module **270** may also signal control information to a web browser component **213** of User terminal **210**. The control information may be in the form of commands to access and display a web site associated with the media resource. The commands may be provided to an application program interface **279** of the web browser component **213**. This allows the system **200** to display the web site associated with the media resource selected to be played back on user terminal **210**. Thus, user terminal **210** may play back media from the media resource while displaying the web site where the media resource is located. One advantage of this embodiment is that it allows users to receive media playback from the media resource in one medium, such as audio, while providing images, audio text, or media not associated with the media resource. Thus, users can listen to songs from media resources signaled to user terminal **210**, while viewing banner ads on the web site where the media resource is located.

Each URL signaled from web server module **270** has a network protocol. For media resources, and specifically audio files, types of protocols include "HTTP" protocol, "PNM" protocol (RealNetworks, having RM extensions), or "RTSP" protocol (having RAM extensions). The URLs signaled by web server module **270** include the protocol at an initial portion of the string forming the URL. Preferably, for HTTP protocol files, the string portion corresponding to "HTTP" is replaced with "PNM". This adjustment prevents playback component **211** from failing as a result of a bug in the media playback component, particularly if the playback component **211** is a RealNetworks Player™.

The web server module **270** may be either a network-side module, client side module, or a combination of both. In either embodiment, web server module **270** may access the database directly or indirectly.

FIG. **6** illustrates a process for a component of an Internet media search module, under an embodiment of the invention. A process such as described with FIG. **6** may be used to build a database of media sites, where each media site includes media links and/or links to other media sites. In an embodiment, the process of FIG. **6** is applicable to meta-crawler module **234** in system **200** (FIG. **2**).

The process of FIG. **6** is a backend operation that is unobservable to a user of the user terminal. Preferably, the flow process of FIG. **6** is an automatic or programmatically controlled process, conducted periodically. For example, media links may be identified and stored under a flow process such as shown by FIG. **6** every few days or weeks. The duration between executions of the flow process of FIG. **6** maybe referred to as an idle period.

The process of FIG. **6** provides for extracting URLs of media sites from a web pages directory. Examples of a web directory for use with an embodiment of the invention includes directories on web sites such as Yahoo.com® and Lycos.com®. The flow process of FIG. **6** is a backend operation that is unobservable to a user of user terminal **210**. Preferably, the flow process of FIG. **6** is an automatic or programmatically controlled process that does not require human interaction.

In step **410**, a directory home page is added to a searched-pages data structure. The searched-pages data structure maintains. A similarly structured parsed-pages data structure is also maintained to hold URL of pages already processed by the module. The parsed-pages data structure indicates whether a home page web directory was previously parsed by the process. The searched-pages and parsed-pages data structures are keyed or indexed by URL and they support querying for existence of a given URL in them. Examples of keyed or indexed data structures include database tables and hashtables.

In step **410**, the parsed-pages data structure is empty, indicating that the directory home pages in the searched-page data structure have not been parsed.

In step **420**, a determination is made as to whether the searched-pages data structure is empty. If the determination is affirmative, the flow process is done. This occurs when the process has parsed all the Internal web pages in the directory. If the determination is negative, a current page link is called from the searched-pages data structure in step **430**. The current page is then loaded into memory and parsed. Parsing means loading and reading the HTML source (or equivalent) code of the web page so its content is accessible and in a machine-readable format.

In an embodiment, the page is parsed using an HTML parser component. An example of an HTML parser is a web browser. Thus, the current page may be parsed using a web Browser component. Specifically, step **440** of the process may be implemented using an application program interface (API) that is exposed by the web Browser component. In this context, the web Browser component is configured and used in a back-end server process with no visible presentation area or end user. It is configured not to load or render media at the web page so that the loading is more efficient. The configuration may occur through the API.

In an embodiment, the web browser is configured to parse web pages efficiently by, for example, automatically excluding a presentation layer from being displayed. Further, the web browser may be programmatically configured to not load or parse information that is not critical to the search function. For example, the web browser component can be configured to not load media data found on web pages.

In step **440**, all links to media sites on the currently parsed-page are determined using the parser. The HTML parser API allows access to the page document object model. In step **450**, all new external page links are added to the media sites database. An example of a web-page data structure is provided with media site database table **243** (FIG. **2**). The database stores the URL of the media sites and not the sites themselves. New external page links implies media sites that are not already indexed or present in the media site database.

In step **460**, all URLs also link to internal links found on the currently parsed page are added to the web pages data structure, provided that the URL in question is (i) not already existing in the searched pages data structure and (ii) not already existing in the parsed pages data structure. In step **470**, the currently parsed page is moved to the parsed pages data structure, and the flow process returns to step **420**. This process adds the URL of all the media sites indexed by the directory to the media sites database.

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FIG. 7 illustrates another component of an Internet media search module, under an embodiment of the invention. A process such as described with FIG. 7 may be used to identify and store media links to web resources that are accessible from one or more web site. The process of FIG. 7 may be used in conjunction with a process such as described with FIG. 4. In an embodiment, the process of FIG. 7 is applicable to media search engine 238 in system 200 (FIG. 2).

In an embodiment, the flow process of FIG. 7 is a backend operation that is unobservable to a user of the user terminal. Preferably, the flow process of FIG. 7 is an automatic or programmatically controlled process, conducted periodically. For example, media links may be identified and stored under a flow process such as shown by FIG. 7 every few days or weeks. The duration between executions of the flow process of FIG. 7 maybe referred to as an idle period.

The flow process of FIG. 7 assumes access to a media sites database store. The database includes URLs to each media site. An exemplary database of media sites includes media sites and metadata table 243, described with FIG. 2. Each record contains a URL field for media site and a field indicating the last date, if any that the process described in FIG. 5 lastly processed the web site at the URL in the URL field. Reference to a media site that is parsed implies that the media site was programmatically examined for media links to web resources, and for links to other media sites using a process such as the one described in FIG. 5.

In step 510, MIME types are determined for web resources. Examples of MIME types that can be selected for step 510 include JPEG, MOV, RAM and WAVE.

In step 515, a record for a media site is fetched or received from the database. A condition of the media site received is that the media site was not parsed by the process described here during the idle period. This condition may be specified by checking, for example, the date field associated with the record. For example, a date field may indicate when the media site was previously parsed.

A determination is made in step 520 as to whether a record and a URL was received in step 515. If no URL was received, the system interprets that all media sites in the database have already been parsed during the idle period. If a URL is received, the system in step 525 adds the URL of the media site to a URLs data structure of media sites to be processed. The URL data structure of unparsed media sites may be indexed or keyed. For example, the URL data structure may be a list, or a hashtable software data-structure.

In step 526, the last search field of the record fetched in step 515 is updated with the current date to indicate that the media site is parsed. In an embodiment, the field corresponds to a date in which the last parsing occurred.

In step 530, a URL in the date structure of unparsed media sites is fetched or received. If in step 535, a determination is made that the URL data structure is empty, the system returns to step 515. As will be further described, the flow process returns to step 515 only when step 570 is completed. If a determination is made that the URL data structure is not empty. Thus, steps 510–545 allow the flow process to distinguish between when a media site is being parsed for the first time, or has been previously parsed by the process during the idle period.

In step 545, media links on the media site fetched in step 530 are extracted from the HTML code of the page fetched in step 530. The media links are associated with web resources on that media site. In step 545, the media resources may be in any MIME format recognizable as media. In an embodiment, the currently parsed page is parsed using an HTML parser. An example of an HTML parser is a web browser. Thus, the media links may be extracted using a web browser. Specifically, the media links may be extracted using an application program interface (API) provided by a web browser software or hardware component. The web browser may be configured to perform this task efficiently by, for example, excluding a presentation layer. Further, the web browser may be programmatically configured to not load or parse information that is not critical to the search function. For example, the browser component may be configured to not load media data found on web pages.

In step 550, new media links on each media site that match the MIME format specified in step 510 are added to a database. New media links refers to media links that do not already existing in the database from, for example, a previous execution of the flow process. In step 555, metadata is extracted from each new media link found in step 550. The metadata may also be stored in the database, with a reference to the URL the media that the metadata refers to. An exemplary database is provided with media and metadata table 247 (FIG. 2). An example of metadata is the URL of the web Page that provided a link for each media URL.

In step 560, the URLs of all new internal media site links on the media site currently being parsed are added to the URL data structure. New internal media site links refers to URLs of media sites that do not already exit in the URL data structure and that are not in the parsed URL data structure.

In step 570, the currently parsed page is removed from the URL data structure and added to the parsed URL data structure. The flow process returns to step 530.

D. Verification and Extraction Flow Processes

FIG. 8 illustrates a flow process that verifies and extracts metadata from Internet streaming media files. While media links are specified, other embodiments of the invention may employ the flow process of FIG. 8 within a system that incorporates verification and extraction of any content or resource associated with links stored in a database. A specific application employs a process such as described with FIG. 4 in the system 200. In the system 200, flow process of FIG. 8 may be performed by the AMVME module 240.

In step 610, a module operating the flow process of FIG. 8 fetches or receives an unverified URL from a database. An example of such a database is provided by media and metadata table 247 (FIG. 2). The unverified URL corresponds to a media link on a media site stored in a database such as the media site database 243 (FIG. 2).

In step 620, a determination is made as to whether a URL for a media link is present. If the URL to the media link is not present, the module assumes all media links have been determined as being verified, and the process is done.

If a URL exists, the module in step 630 loads the URL into an Internet multimedia playback software component and programmatically control the component to provide metadata embedded in the media file. In response to this request, the component loads some or the entire file over the Internet and provides the process with this information. In step 640, a determination is made as to whether the media or web resource associated with the URL was successfully loaded over the Internet by the module. If the determination is that media was not loaded, then in step 650 the URL associated with the media link is marked as unavailable and verified. The media is marked as verified to prevent the process from revisiting it once it already extracted metadata for it and verified it. The availability mark assists the flow processes described in FIG. 9 and FIG. 10. The determination may be in the negative if, for example, the media link is old and no

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longer contains a media file that is available for playback through its URL, or if the media link contains content other than what is designated as media.

In an embodiment, the process may use an availability rating for each media. Under such schema, each media is assumed to have the maximum availability score. For media that are currently not available for playback, step **650** may lower the score by one. The system may consider the media as unavailable if its score is below a predefined threshold. This process is useful since Internet streaming media availability may vary according to factors such as web server load and the time of day or year.

If the media is loaded, then in step **660** the media metadata is extracted from the playback component. Examples of metadata that can be extracted in this step include artist name, playback duration, playback quality, frame size etc.

In step **670**, extracted metadata is stored in a database with the associated URL of the media link that was presently verified. In step **680**, the URL of the media link presently verified is marked as verified in the database. The flow process then returns to step **610**.

FIG. **9** illustrates a process for interactively adding metadata to URLs of media stored in a database. In an embodiment, the database may correspond to verified URLs of media links determined in FIG. **8**. For example, a process such as shown by FIG. **9** may be performed on information stored by AMVME module **240** in media and metadata table **243**. The process of FIG. **9** may be performed by a module interface, such as editor interface **275** (FIG. **2**).

In step **710**, an unedited media record is fetched or received by an interface module from a database. The unedited record may be one or more categories of metadata and other information about a media link, media site, or web resource. In an embodiment, the unedited media information includes a URL to a media link, as well as metadata extracted programmatically, such as described with FIG. **8**. In step **720**, a determination is made as to whether a record was received. If no record is received in step **720**, the flow process assumes there are no unedited records remaining in the database, and the process is done. If a record is received, the in step **730** the interface module is updated with the record received. This may correspond to displaying the record fields to the editor operating the editor interface.

In step **740**, the web resource associated with the record received is loaded into an Internet multimedia playback software component. Preferably, the software component is programmatically constructed and controlled by the module interface. The software component plays back the media to the editor. The editor is able to experience the media played back from the web resource associated with the media link. The editor is able to determine metadata information regarding the web resource. For example, the editor may determine mood, genre, quality, appropriate mix name, and description of a web resource such as an audio media creation or a home movie clip. In an embodiment, the editor controls playback of media located by the search engine on the network side, such as by pausing and playing media back through an editor interface.

In step **745**, a determination is made as to whether the record received also includes previously determined metadata. The previously determined metadata may be extracted programmatically in another process, such as described with FIG. **8**. If the determination is made that the record received does not contain extracted metadata information, then in step **750** the editor interface automatically extract metadata from the web resource associated with the URL of the record. To accomplish this step, the editor interface may access another module that automatically extracts certain types of metadata information. For example, the editor interface may forward the record to AMVME module **240** (FIG. **3**) that performs a flow process such as shown by FIG. **8**.

Once metadata is included with the record, then a determination is made in step **760** that the editor operating the interface module may choose to save the auto-extracted metadata already included with the record in the database. If the determination to step **760** is negative, then in step **765** the editor updates media information with editor provided metadata using input elements on the editorial software user interface. Once the determination in step **760** is positive, the record is marked as edited and updated in step **770**. Then, all the newly added metadata for the media record is updated to the database. The process then continues from step **710** for the next unedited media. The media is marked as edited so it won't be included for editing in the process.

FIG. **10** illustrates a process for generating a play-list. The flow process of FIG. **10** assumes that play-lists names are predetermined and stored in a database. Each play-list is identifiable by its name. For example, classic music, jazz and rock. The play-lists include records of media links. In an embodiment, a record includes at least a URL to a streaming media that is categorized in a database as belonging to the play-list name. In step **810**, a play-list name is received from the-play-lists database. In step **820**, a determination is made as to whether a play-list name was received. If the determination is negative, the system assumes it produced play-lists for all play-lists names, and the flow process is done. This process is routinely executed to add all newly added media to the appropriate play-lists.

In step **830**, media records that match search criteria are fetched from the media database. The criteria is that each record play-list record field must match the current play list name obtained in step **810** and that the 'in-play-list' record field for the play list name has False value. In step **840**, a play-list is generated to include all media stored at the records fetched is step **830**. The new play-list contains one record entry for each fetched media record. Preferably, each play list record includes media URL and metadata information that is obtained from the media database record.

In step **850**, the media records called in step **840** are labeled as being in the "in-play-list" for the current play-list name. This is achieved by setting the "in-play-list" value for the media database record to true for the appropriate play-list name.

In step **860**, the generated play-list is made available to a server-side module, such as web server module **270** (FIG. **2**). As an example, the play-lists may be stored, copied or appended to be made available on the web server module. Once the play-lists are available on a server-side module, media URLs and metadata stored in the play-lists is made available to the user terminal so that the user terminal may customize media output available from the play-list. Specifically, one or more playback applications that run on the user terminal may read the play-lists, access media links on the play-lists, continually play-back streaming media from media URLs in the play-list and present media metadata to users for further interaction. The play-list may also be configured to provide access to a client-side media player component that uses a URL of a media link to load and play the media associated through it. Additionally, users may further modify and edit play-lists to create personalized media programming. Further, play-lists may be dynamically generated by a web application in response to a request for media playback made on the user terminal.

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FIG. 11 is a flow process for software or hardware application that enables a user terminal to playback streaming media programming determined by play-lists. An embodiment described below assumes that play-lists are available for the process, and that play-lists are identifiable by play-list names. For example, the play-lists may be dynamically generated by the play-list module, in response to a search criteria signaled from a user terminal. The play-lists may also be manually generated by editors on the network side. The play-lists may be predetermined by, for example, a process described with FIG. 10. The playback component can access the play-list without any direct interaction with server side modules

In an embodiment, the flow process employs a streaming media player component installed on the user terminal. The media player may be preexisting on the user terminal. Examples of media players for use with an embodiment include RealNetwork Player™, Microsoft Windows Media Player™, and Apple QuickTime™. The application described in the process may be web based or installed on the user terminal.

In step **910**, an application interface for a media player on the user terminal is provided.

In step **920**, a default play-list name is selected from a list of play-lists. In an embodiment, a database of play-lists is stored on or accessible through the web server module **270**. The play-list generator module creates and stores play-list on the web server module to provide the interface with the user terminal **210** and media player stored thereon. Each play-list may store two or more media links, and preferably a plurality of media links.

In step **930**, one or more play-lists for the current play-list name are loaded. In step **940**, media is presented and played-back on the user terminal. To playback media, server-side modules may provide the media player with URLs to media links that are stored in each play-list. Each play-list may include one or more media link URLs and media metadata. The user terminal then accesses the URL and loads the web resource associated with that media link into a streaming media playback component on the user terminal. Media playback on the user terminal includes outputting, for example, audio and/or video stored in digital format on web resources associated with a media link. In embodiments where the web resources include video media, the step described may dynamically adjust the interface size and the playback component that will handle the actual playback according to the media clip metadata.

Under an embodiment of the invention, the media playback component continuously plays back media by (i) accessing a first site on the network and playing back media from the first site, (ii) then automatically accessing a second site and playing back media from the second site. The media sites may be provided by play-lists which that are made accessible to the media playback component. The sequence for automatically and continuously playing back media may be repeated for each media link included in the play-list. The play-lists may include hundreds of media links, thus allowing the media play back component to automatically aid continuously play back media using numerous sites on a network. As a result, a user is able to experience continuous media play back for hours at a time

The user terminal also includes an interactive interface to affect the media being played back. An end user on the user terminal may choose to manipulate media playback through one or more commands that may be inputted through the application interactive interface or presentation layer.

In step **945**, a determination is made as to whether an event occurred. If an event occurred, the flow process determines the event. The flow process may determine the event that occurred sequentially or concurrently. Preferably, the flow process is configured to receive media playback event from the streaming media playback component. If the event is to skip the currently played media, then a determination in step **960** causes a corresponding action of the media being skipped, and the process step returning to step **940**. If the process received a playback error event, or an playback error event, then a determination in step **965** causes the flow process to return to step **940** to playback media from the next web resource of the play-list or play-list name.

If a user quits the application, or signals to quit, then a determination in step **970** causes the flow process to be done. In step **975**, a user may choose to view a new media web site while media is being played back on the user terminal. Then in step **980**, the media web site is opened in a new Internet window, preferably using the client side web browser.

In step **982**, a determination is made as to whether the action selected by the user on the user terminal is to send an e-mail message to one or more e-mail addresses that allow the receiver(s) to playback the current media and the current play-list played by the sender at the time of the event. A user may send either an e-mail containing the URL, the play-list, the play-list name or a URL link. When the message receiver clicks on the link, his terminal will execute the media playback application and will start playing back the media and the play-lists played at the time of the message-sending event. If the determination is positive, then in step **984** the user terminal prompts the user for an one or more e-mail addresses, and then prompts the user to transmit the e-mail. The user need not have an e-mail client software application for the operation to succeed. The e-mail may be directed to terminals having a streaming media playback component and Internet access.

Preferably, the e-mail message is directed to a user having a user terminal that communicates with server-side modules so that the recipient user terminal is automatically plays back media from the transmitted media link received upon the e-mail being opened. Thus, server side modules may receive addresses from the terminal and act as the source of the email addressed to one or more recipients.

In step **986**, a determination is made as to whether a user wishes to rate a media played back from the media links. If the determination is positive, then the user is prompted to rate the media in step **988**. A rating value is transmitted to a backend web rating system application using the Internet. This operation is part of the service rating system that includes server side modules that produce, in combination with this operation, top and bottom rating media in each media category.

Step **990** illustrates other exemplary actions that may be received from a user on the user terminal interfacing with the playback application. For example, user actions may correspond to pausing media playback, adjusting volume, picture controls, size, seeking within the media, etc. In step **992**, playback settings are changed according to user input. In an embodiment, the flow process returns to step **945** to check for another event if any of the determinations in step **982–992** are negative.

E. Rating System for Media Play Back

An embodiment of the invention includes a rating system with a media search and playback system. The rating system allows users to listen or view media segments available over the Internet according to a rating. In addition, users participate in determining rating media segments by providing a rating input after listening or viewing a media clip. The ratings may be used as a category, similar to other categories such as genres or categories.

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FIG. 12 illustrates an architecture for use with the rating system, under an embodiment of the invention. The rating system **1000** may be employed with, for example, the system **200** (FIG. 2). The rating system **1000** may include or cooperate with components of a system such as described with FIG. 2 to enable the user view and/or select media clips from play-lists. The generated play-lists may contain a list of links to media on the Internet. Selection of media clips by the user causes media to be played back to the user over the user terminal.

The rating system **1000** includes a backend database management component **1045**. The database management component **1045** maintains organizational data structures such as tables that describe rating information for media clips. The media clips include Internet streaming audio or video. The rating information may be in the form of values such as, for example, total votes counted. In an embodiment, database management component **1045** maintains records that comprise meta information on each media clip including the URL to the media clip, the current rating of the media clip, and the total votes for that media clip.

A user **1010** on a user terminal interacts with a web-based playback interface **1020**. As an example, play-back interface **1020** outputs play-lists **1018**, **1022** to the user. The media clips in each play-lists may be outputted automatically, or displayed for the selection of the user. The play-back interface **1020** may also display to the user genre field **1016** or category field **1014** of the selected media clip, or play-list **1018**, **1022**. The playback interface **1020** includes features to enable a user on the user terminal to make entries or selections regarding preferences and opinions, as well as other types of information. The user may also view ratings stored on backend database **1045**. The user may enter selections by, for example, using icons or other display features. The user may make entries by, for example, inputting text or voice. FIG. 12 illustrates a rating selection component **1012** as a feature of play-back interface **1020**. As an example, the rating selection component **1012** allows users to rate a media output between a scale of 1 to 5.

A user **1010** may input a rating to play-back interface **1020**. The rating is signaled from play-back module **1020** to a rating module **1030**. In an embodiment, rating module **1030** maintains a tally for each media clip. The tally compiles ratings received from play-back module **1020**. The ratings may be received from more than one user and/or user terminal. The tally may be implemented through a protocol that enables the rating module **1030** to organize media clips according to an order. The organization of the media clips may correspond to a user preferential list, where preferred media clips are, for example, listed together or listed before less preferred clips. The rating module **1030** may also determine a genre, category, or other organization information through selections or entries received from the play-back module **1020**. The selections may be tallied through any protocol, such as summation, averages, weighted averages and moving averages. In another embodiment, the rating module **1030** may maintain a text field to store user comments regarding each media clip.

In an embodiment, the rating component **1030** updates the rating information maintained in the database management component **1045**. For example, the rating component **1030** may update values of the current rating and total votes for each media link.

A play-list generator **1040** generates play-lists based on rating information maintained in the database management component **1045**. The play-list generator **1040** may signal to retrieve or receive records for each media clip. The play-list generator **1040** then automatically generates one or more play-list **1042**. As previously discussed, each play-list is a list of media links. In an embodiment, the play-lists **1042** are generated according to the current rating and/or rating for each media clip. The generated play-lists are provided by the play-list generator **1040** for the play-back interface **1030**.

The user **1010** may choose to listen to play-lists containing media clips rated according to one or more criteria. The play-lists may also be organized according to other factors, such as genre and category.

FIG. **13** is a flow chart that allows a user to listen to media clips that are rated according to one or more criteria. In step **1110**, the user is provided a user-interface that allows users to receive media sorted according to one or more categories. The categories correspond to genres, such as type of music etc.

In step **1120**, the user selects a category from the options presented by the user-interface. In response to the selection, the user terminal is provided one or more play-list in step **1130**. The play-list received by the user-terminal matches the category or genre selected by the user. Further, play-lists contain predetermined media links to media clips. The media clips in each of the play-lists are determined according to a rating system, using a system such as described by FIG. **12**. The predetermined play-list may correspond to a play-list generated by play-list generator **1040** (FIG. 12). Once the play-list is received by the user terminal, the flow process returns to step **1120**.

In step **1140**, media clips are played back on the user terminal. The media clips are played back consecutively and automatically, so that the user experiences continuous media playback. For example, the play-lists may contain numerous media creations from a selected genre. The media creations may be determined for the play-list according to a rating formula. The user is provided the media creations of the selected genre continuously, so that the user's media experience resembles listening to an album.

FIG. **14** illustrates a flow process for updating a rating of a media clip, under an embodiment of the invention. In step **1210**, a module is provided a rating event. The rating event is a rating for a particular media clip, having an associated URL. The rating from the user is predefined from a closed set. For example, the user may provide a rating from 1 to 5.

In step **1220**, a record is located for the media clip that was currently rated. The record may be stored in a database, and include the media link for the media clip, the current rating of the media clip, and the votes received for that media clip. In an embodiment, the record may include more than one URL associated with the media clip that was rated. In an embodiment, the record is maintained in database management component **1045** (FIG. 12).

In step **1230**, a rating field for the media record is updated. The rating field may correspond to the current rating of a media clip. A module such as the rating module **1030** may update the rating field in database management component **1045** (FIG. 12). The media record is updated to determine a new rating. In one embodiment, the new rating is an averaged based formula. The formula may also be weighted. An example of a formula to determine a rating, under an embodiment of the invention is:

$$\text{Newrating} = 1/(n+1)(N^*(\text{old rating}) + \text{user provided rating})$$

N is the total number of votes received, and newrating ranges between 0 and a maximum value.

In step **1240**, record for the media clip rated is further updated to add an additional vote to the field for votes received. The flow process then returns to step **1210**.

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FIG. 15 illustrates an exemplary structure for a database to maintain updated records on ratings and votes tallied. The table may associate values corresponding number of votes, rating, and other information to a media link containing a media clip.

FIG. 16 illustrates a flow process for generating media clips into play-lists according to a rating criteria. Play-lists including a rating criteria are referred to as rated play-lists. The flow process assumes known categories for media clips. The flow process also assumes a rating for rated media clips, and the number of media clips in a rated play-list. The flow process may be used with any of the aforementioned embodiments.

In step **1410**, a next category may be fetched from a database containing the different categories of media clips. In step **1420**, the system makes a determination as to whether a category was received. If no category is received, the system assumes that there are no more media categories to be rated.

In step **1430**, a new play-list is created for a current category. In step **1440**, up to N rated media clips from a database of rated media clips are added to the play-list. Preferably, N is a constant in the flow process. Then in step **1450**, an old play-list is deleted, and the new play-list is saved. The new play-list may be saved in a format that follows predefined protocol so that the play-list and its contents are accessible to a streaming media play back interface. The flow process then returns to step **1410**.

FIG. 17 illustrates a flow process for programmatically categorizing media files. The process assumes a database containing metadata associated with media clips. The metadata includes metadata provided by a human editor. For example, the metadata may pertain to categories such as genre, mood and atmosphere.

In step **1510**, a record is retrieved from the database. The record is retrieved with metadata information containing a first type of metadata information and a second type of metadata information. As an example, the first type of metadata information may correspond to a genre of music, and the second type of metadata information may correspond to an artist. In step **1520**, a determination is made as to whether a record was received. If the determination is negative, then the process assumes that all media clips have been categorized.

If the determination in step **1520** is positive, then all records in the database having the first type of metadata information are retrieved in step **1530**. In step **1540**, all records retrieved in step **1530** are updated to include the second type of metadata information. As an example, all records belonging to a particular artist (first type of metadata information) or given additional metadata information of a particular genre (second type of metadata information). The process then returns to step **1510** to retrieve another record.

In one embodiment, the second type of metadata information is a genus category, and the first type of metadata information is a species of the first type of metadata information. Once the first record is known to have the a particular species and genus, the genus may be determined and stored for all records having the same species.

F. Personalized Media Playback

FIG. 18 is a flow process to create personalized play-lists of streaming media files available on the Internet (or other networks). The play-lists may be personalized by users on user-terminals.

In step **1610**, a user chooses to add a URL of a selected media clip to a personal favorite play-list. In step **1620**, the flow process adds the URL (and metadata) of the selected media clip to a user terminal store for user persistent information, such as an Internet cookie. The persistent data store is then accessible for the web-based play back application on the user terminal.

In step **1630**, the user selects to play back media clips from that user's favorite play-list. In step **1640**, the system reads back the media clips from the persisted data store. In step **1650**, the system plays media clips using a URL associated with each media clip. The cookie may also provide additional URLs. Thus, multiple media clips may be played continuously from different sites on the Internet.

The user may edit the play-list, change an order of the play-list, or delete selections from the play-list. The user may designate certain play-lists as personal, so as to identify the play-list with that user's terminal. Alternatively, the play-list may be stored on a network server and accessed using the media location and playback module. Users may access their personal play-lists from any one of a plurality of terminals that have access to the system.

G. Distributed Architecture

An implementation under an embodiment provides a distributed architecture in which a user terminal accesses media resources from a plurality of network sites. In a network such as the Internet, the user terminal accesses multiple web sites to playback media locates as files on those web sites.

A network site includes any network location having internal links. Embodiments of the invention access network sites providing links to media files and/or other network sites. A web site refers to a network site on the Internet. Examples of web sites include web pages, including web pages with HTML links to other web sites, to media files, and to other types of files.

The distributed architecture inverts conventional media distribution paradigms. Numerous streaming media files can be streamed to an individual user terminal continuously from throughout the Internet using the embodiment of the distributed playback architecture. The distribution architecture is scalable to provide thousands or millions of streaming media files to user terminals. The users can then play media files located throughout the Internet in a continuous manner from the numerous Internet sites.

FIG. 19 illustrates a distributed playback architecture, under an embodiment of the invention. A user terminal **1710** has access to N network sites that provide access to media, also referred to here as media sites. The N media sites **1722** via web server module **1770**. The media sites **1722** each have one or more links to media web resources. The links are represented by URLs 1–N. The web server module **1770** can load the media resources onto a media playback component of user terminal **1710**. Once loaded, the media resources are played back by a media playback component on user terminal **1710**.

In an embodiment, the media sites **1722** correspond to different locations on a network such as the Internet. For example, media sites may have different Internet addresses, including different domains. Each media site provides direct access to a media network resource. This implies that a URL (or link) to one of the media sites accesses the media network resource for playback without accessing another internal URL (or link).

In an embodiment, web server module **1770** signals multiple URL links to user terminal **1710**. The media playback component of user terminal **1710** accesses each link to playback the media resource. The URLs are selected for media playback so as to output media from user terminal **1710** according to a predetermined program.

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In an embodiment, the program is selected or defined from a search request of user. For example, a search request may designate a category for media output, such as a genre and artist. All URLs containing media from that artist and genre may be gathered and signaled from web server module **1770** to user terminal **1710**. The URLs may be provided in any order, such as random, etc or a chronological order of the artist.

In another embodiment, a program may be provided by one or more play-lists. Each play-list in the program may be generated by, for example, a play-list generator **1040** (FIG **12**). The play-lists may be personalized for the user of the end terminal **1710**. For example, play-lists may be generated for preferences and profiles specified by the user of user terminal **1710**. As another example, a user may couple to the Internet, prompting web server module **1770** to automatically signal one or more play-lists containing the URLs to user terminal **1710**. Still, other embodiments provide for URLs to web resources, or play-lists containing the URLs to be randomly provided to user terminal **1710**.

Among other advantages, the distributed architecture permits simultaneous playback of, for example, thousands or millions of multiple streams which do not congregate on a single point. This avoids congestion arising under examples of the current media paradigms. This ensures that the embodiment of our distributed architecture may "scale," or permit the simultaneous playback of, for example, thousands or millions of simultaneous streams. Further, the quality of the user experience is not affected by scaling a system under the distributed architecture embodiment.

In contrast, conventional broadcasting employs one radio or television signal to broadcast to listeners or viewers. Media files disseminated over the Internet today may be distributed in a manner which is somewhat similar in that the media file is located on a single server (or small group of servers) which is accessed by potentially large number of Internet users. As a result, the experience of the users may diminish due to the limited ability of current systems to scale.

This distributed playback architecture, the delivery of streaming media through this playback architecture, in combination with the search functionality performed by the back-end module, and the rating and personalization features of the playback client terminal module permits the creation of a broadcasting system that is personalized by an end user. A personal broadcasting system permits each individual user to create media programs which can be sent to, for example, thousands or millions or other users who can simultaneously play different programming combinations using a distribution of Internet (or other network) sites.

An example of a distributed architecture playback system includes wireless devices that are communicatable to a network containing media resources. For example, media playback component **1710** may be loaded onto a wireless access protocol (WAP) enabled device. Examples of WAP enabled devices include handheld computes and cell phones. The WAP enabled device may use a wireless communication network to access network server module **1770**. The WAP enabled device may also include output features, such as speakers or a display screen. The WAP enabled device accesses media sites **1722** by control of network server module **1770**. The WAP enabled device then plays back media from the media sites **1722**. The WAP enabled device may then be used to simulate a portable radio.

As another example, an automobile may be equipped with a wireless device. The wireless device accesses multiple media sites on a network such as the Internet to and provide playback of media clips. For example, the user may select to hear music from a favorite play-list using the WAP enabled device in the automobile.

II. Messaging Applications

FIG. **20** is a diagram illustrating a messaging application, under an embodiment of the invention. The messaging application enables the user to share a media playback experience with other users having access to the network.

FIG. **20** assumes the messaging application is operated on a network such as the Internet. In the embodiment, a network interface or network-side module is used to enable messaging, rather than a client messaging applications. Examples of messaging applications for use with embodiments include e-mails, which are delivered to a folder on a recipient's terminal. Other types of electronic messages include instant messages, which can be displayed or heard on the recipients terminal automatically upon arrival.

A messaging module **2080** receives a messaging request from a first user terminal (sender) **2010**. The messaging module **2080** may be an application or portion of network server module **2070**. The messaging request is entered by the user through the user-interface **1900**, using for example, an e-mail selection field **1990**.

The messaging module **2080** receives addresses to deliver messages to recipient terminals (recipient) **2020**. The sender **2010** may manually signal the recipients address using entry methods such as keyboards, graphic user selection features, or audio commands. Alternatively, messaging module **2080** has access to network stored addresses for the specific user. The network stored messages are then selectable from a terminal by the user on the sender terminal **2010**.

In response to a request from sender **2010**, messaging module **2080** generates a message **2085** for the recipient. The request may also include the address of the intended recipient(s). The message **2085** is sent to all recipients **2020** specified by sender **2010**. The contents of the message **2085** include a URL to the network server module **2070**. In an embodiment, the URL in the message is packaged with arguments or other coding to identify a play-list maintained on the network server module **2070**. The URL may also be packaged with arguments to identify the specific song being played when the sender causes the message to be transmitted to the recipient. Alternatively, the URL may identify to the recipient the search request or criteria used by the sender.

The recipient may choose to return a message **2082** to signal messaging module **2080**. In one embodiment, the content of the message is constructed so that once the message is opened, the user can select a link to a module that stores or maintains the play-list **2075**. For Internet applications, the link is HTML formatted to include the URL of network server module **2070**, and arguments to identify the play-list selected by sender **2010**. Once network server module **2070** is accessed by the recipient **2020**, arguments **2088** contained with the link identify the specific play-list **2075** experienced by sender **2010** when the request to send the message was made.

If the message is instant, the recipient **2020** can respond immediately to simultaneously share the experience of sender **2010**. Alternatively, the recipient **2020** can be made to respond automatically upon the recipient **2020** receiving the message **2085**, so as to enable sender **2010** and **2020** to simultaneously or concurrently share the same media playback.

The argument **2088** that is packaged with the link may also identify individual media clips, and/or an entire play-lists. The recipient **2020** is able to experience media playback from individual media clips selected by sender **2010**.

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In another embodiment, message **2085** is constructed so that once the message is opened, the user is automatically connected to network server module **2070**. The message may be an e-mail, stored in a designated folder of recipient **2020**. The e-mail may include an HTML formatted URL to cause the recipient's terminal to access and communicate with network server module **2070**. The HTML formatted URL may also include code that causes the user terminal to automatically access network server module **2070** upon the e-mail being opened. The HTML formatted link may also include arguments to specify the play-list **2088** and/or media clip identified by the sender, as well as other parameters of the URL. Once the play-list or media clip is identified by network server module 2070, the recipient **2020** is able to share the media playback experience of the sender **2010**. The sender **2010** can experience the media playback at the time sender **2010** requests the message to be sent.

In the embodiments shown, sender **2010** can select a media program that is signaled transmitted to recipient **2020** by messaging module **2080**. The program may correspond to one or more play-lists, playing back multiple media resources. While sender **2010** is being played back the program, the sender **2010** can specify the address of recipient **2020** to messaging module **2080**. The messaging module **2080** generate a message that includes a selectable link to enable the recipient to access the network server module **2070**. Arguments or scripting contained with the URL identify the particular play-list being signaled to the sender **2010**. Since the play-list is updated after every media resource is played back to sender **2010**, recipient **2020** accesses the play-list at the selection being played back to the sender **2010**. The play-list is then signaled to the sender **2010** and recipient **2020** simultaneously, or approximately thereabout. Alternatively, recipient **2020** accesses the play-list beginning with the media clip played back to sender **2010** when the sender **2010** selected to transmit the message to recipient **2020**.

As an example, sender **2010** transmits a search request causing media, based on search criterias of a specific artist and a ranking. The network server module **2070** identifies URLs matching the search request and forms play-list **2075** for sender **2010**. After reviewing the play-list **2075**, the sender **2010** decides to share the media playback with a friend, recipient **2020**, whom the sender believes would appreciate play-list **2075**. The sender **2010** requests messaging module **2080** to transmit message **2085** to recipient **2020** by submitting the recipient's e-mail address to the messaging module **2080**. The message **2085** sits on the recipient's terminal until accessed. The recipient **2020** selects message **2085** to access play-list **2075**. Unless the messaging is nearly instantaneous, the recipient experiences media playback from the play-list **2075** when sender **2010** request message **2085** to be sent. Alternatively, sender **2010** may request the entire play-list **2075** to be transmitted to recipient 2020. In this way, sender **2010** and recipient **2020** may share a common interest in certain genres, category, artists etc. of media playback.

I. User-Interface

FIG. **21** illustrates a user-interface **1900**, under an embodiment of the invention. The user-interface **1900** may correspond to the play-back interface **1020**, described with **FIG. 10**. Alternatively, the user-interface may be a terminal side component in communication with one or more server-side modules, such as for example web server module **1070** (FIG. 12).

In an embodiment such as shown by FIG. **12**, user-interface **1900** includes a plurality of user-interactive features. The user-interactive features enable users to interact with the system **200** from the user terminal **210**. Some of the plurality of user-interactive features allow users to submit search requests and other media requests for playback. Other control user-interactive features allow users to affect the play back of the media resources.

The user-interface **1900** may output to the user information, images, and/or audio that is different than the media resource being played back. For example, user-interface **1900** displays metadata information to the users about the media resource being played back. In addition, the user-interface **1900** enables users to, for example, view advertisement, receive electronic messages, and create and manage play-lists.

In an embodiment such as shown by FIG. **21**, the user-interface **1900** includes a first menu field **1910**, a second menu field **1920**, and a third menu field **1930**. The first menu field **1910** allows the user to select a first criteria for media resources that are to be played back. The second menu field **1920** allows the user to select a second criteria from a set of media resources matching the first criteria. The third menu field **1930** allows the user to select a third criteria from the a set of media resources matching both the first and second criteria. Each of the menu fields **1910–1930** may be in the form of click and drag-down menus.

The user-interface **1900** may also include a text field **1940**. The text field **1940** allows users to enter a search criteria. The search criteria entered in text field **1940** may be combined with the search criterias of one or more menu fields 1910–1930 using a Boolean operation. Preferably, all search criterias are AND together into a single search criteria. For example, the search criteria entered in text field **1940** may correspond to an artist name, or a title of a media creation.

In an embodiment, the user-interface **1900** provides features that prompt a user for input, such as for one more search criterias. The web server module **270** receives the search criteria(s) signaled from user terminal **210**, and access media and metadata table **247**. Each of the menu field **1910–1930** may also allow users to enter text field as the search criterias. The search criteria(s) are matched to URLs containing metadata having the same (or equivalent) criterias. For example, the search request may specify a genre, and a first name of an artist. Then, web access server **270** locates URLs to media resources having associated metadata information that identifies the media resource as being of the same genre, and as containing the same first name in the artist name metadata indexed data structure.

The web server module includes a feedback display portion **1950**. The feedback display portion **1950** may signal information, messages, advertisement etc. to the end user. In an embodiment, feedback display portion **1950** displays metadata information about the media resource being played back. For example, a song of a particular genre and category may be played back. The display screen portion **1950** may display the title of the song, the artist name, a play-list associated with the song, a rating component of the song, and the song's duration. Information is read when the media playback component loads the media resource.

Other user-interactive features may also be included in user-interface 1900. In an embodiment, user-interface **1900** includes a play-list feature **1960**. The play-list feature **1960** enables users to add a media creation to a play-list. The play list feature **1960** may, as an example, be a selectable icon. Upon selecting the play-list feature **1960**, a pop-up window (not shown) may be displayed allowing a user to name or select the play-list that will include the media

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resource being played. In this way, a user of user terminal **210** can provide input to create and manage play-lists, using systems such as described with FIGS. **12** and **19**.

The user-interface **1900** may include one or more control user-interactive features. The control user-interactive features may be in the form of selectable icons. A skip feature **1972** causes, for example, web server module **270** to signal a URL of another media creation to the media playback component. This causes the media playback component to start playing back a new media creation. A pause feature **1974** enables users to pause the media playback component from playing back the media resource. The pause feature **1974** may signal the media playback component directly, or cause the web server module to signal the command to the media playback component. Reselecting the pause feature **1974** then causes the media creation to be played back from the portion where playback was paused. Similarly, a seek feature **1976** may signal to seek or move to a specific instance of playback on the media resource. A volume feature **1978** signals the application program interface **276** (FIG. **5**) to raise the volume of the media resource being played back.

The user-interface **1900** may also include a rating feature **1980**. The rating feature **1980** may be in the form of multiple selectable icons, where the icons are arranged to correspond to a rating. For example, five icons may be provided to represent best to worst ratings. In an embodiment, the rating feature **1980** enables a user to rate a media resource during or after it is played back on the user terminal **210**. With reference to an embodiment such as described with FIG. 12. the rating feature **1980** is used to prompt a user to signal a rating to rating component **1030** (FIG. **12**). The rating feature **1980** may be a user response to a media clip played back on user terminal **210**. The rating component **1030** receives the rating and modifies rating information associated with the URL that is stored in **1045**. The rating information may then be provided to other users or user terminals. For example, the rating information may then be signaled to display portions **1950** of other user terminals **210** who select that media clip for playback.

The user-interface **1900** also includes a personal play-list feature **1985**. The personal play-list feature includes iconic selection features, including an add icon **1987** to add a URL to a play-list, and a play icon **1989** to play a personal play-list. The add icon **1987** enables a user to signal play-list generator **1040** (FIG. **12**) to add a URL to the personal play-list. The URL being added to the play-list may correspond to a media resource being played back on user terminal **210**. The play icon **1989** may be selected to cause web server module **1070** (FIG. **12**) to signal URLs from the personal play-list to the media playback component of user terminal **210**. In this way, user terminal **210** may select to have continuous media output from resources previously selected to be on a play-list.

The user-interface **1900** may also include an e-mail selection feature **1990**. The e-mail selection feature **1990** may be iconic, to allow selection by the user upon the media playback. Once selected, an e-mail program on user terminal **210** may be launched. The e-mail program may be directed to open a new message, and attach the URL of the selected media resource.

FIG. **22** illustrates an embodiment in which user-interface **1900** is displayed on the desktop along a second window **2210** showing a web site **2212**. The web site **2212** hosts the media file being played back. In this embodiment, web server module **1070** signals a media file URL to the media player component of the terminal. The web server module **1070** concurrently signals the web browser component **213** on the terminal another URL to the hosting web site. The web browser **213** opens the second window **2210** to display the web site while the media from the media file is being played back on the terminal. In this way, users are displayed the web site hosting the media file while media from the media file is played back. This allows the user to view, for example, banner ads, artist name and titles, and copyright information while media from the web site is being played back.

After the playback is complete for one media file, a URL to a next media file is signaled to the media player component on the terminal. The next URL may be determined by a sequence of a play-list, or by a result to a search term inputted from the user. If the URL of the next media file is hosted on a web site that is different than the preceding web site, then web server module **270** signals the URL of the next hosting web site to the web browser. The second window **2210** then displays a second web site **2212'** that hosts the media file being played back. In this way, the second window **2210** displays only web sites hosting the media files being played back.

J. Conclusion

The foregoing description of various embodiments of the invention has been presented for purposes of illustration and description. It is not intended to limit the invention to the precise forms disclosed. Many modifications and equivalent arrangements will be apparent.

What is claimed is:

1. A method for playing back media from a network, the method comprising:

receiving a search request from a network enabled device to play back media from multiple sites on the network, the search request specifying one or more search criteria;

accessing a memory that includes a plurality of network addresses, the memory associating substantially each address with one or more classes of information, each address accessing a media resource;

selecting a plurality of addresses in the memory by comparing the one or more search criteria to one or more classes of information associated with the plurality of network addresses;

signaling the selected plurality of addresses to the network enabled device; and

causing the network enabled device to access sites located by at least some of the selected addresses and to play back the media resources provided at the accessed sites, including to sequentially play back the media resources provided by at least some of the selected addresses substantially automatically.

2. The method of claim **1**, wherein selecting a plurality of addresses in the memory includes matching the one or more search criteria with a parameter in the one or more classes of information associated with that address.

3. The method of claim **1**, wherein accessing a memory that includes a plurality of network addresses includes accessing a plurality of links to Internet sites, each link containing no other internal link.

4. The method of claim **3**, wherein selecting a plurality of addresses in the memory includes selecting a plurality of links in the database using the search criteria, signaling the selected plurality of links to the network enabled device, and programmatically controlling the network enabled device so as to automatically access and sequentially play back the media resource of each of the plurality of selected links in a designated order.

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5. The method of claim 4, wherein controlling the network enabled device so as to automatically access and sequentially play back the media resource includes sequentially playing back the media resource of each of the plurality of selected links after accessing the respective selected link.

6. The method of claim 3, wherein receiving a search request from a network enabled device includes receiving the search criteria corresponding to an artist name, and wherein selecting a plurality of addresses in the memory by comparing the one or more search criteria to one or more classes of information associated with the plurality of network addresses includes selecting a plurality of links that are each associated with a class of information containing a parameter corresponding to the artist name.

7. The method of claim 3, wherein receiving a search request from a network enabled device includes receiving the search criteria corresponding to a title of a network media resource, and wherein selecting a plurality of addresses in the memory by comparing the one or more search criteria to one or more classes of information associated with the plurality of network addresses includes selecting a plurality of links that are each associated with a class of information containing a parameter corresponding to the title of the network media resource.

8. The method of claim 2, wherein receiving a search request from a network enabled device includes receiving the search criteria corresponding to a musical category, and wherein selecting a plurality of addresses in the memory by comparing the one or more search criteria to one or more classes of information associated with the plurality of network addresses includes selecting a plurality of links that are each associated with a class of information containing a parameter corresponding to the musical category.

9. The method of claim 1, wherein signaling the selected plurality of addresses includes displaying the selected plurality of addresses for a user of the network enabled device.

10. The method of claim 1, wherein causing the network enabled device to sequentially play back the media resources provided by at least some of the selected addresses substantially automatically includes causing the network enabled device to automatically play back the media resources provided by the selected addresses in response to signaling the selected addresses to the network enabled device.

11. The method of claim 1, wherein causing the network enabled device to play back media resources provided at the accessed sites includes causing the network enabled device to play back audio from the accessed sites.

12. An integrated platform for playing back media from a network, the integrated platform comprising:

a network enabled device that includes a media playback component;

a memory that includes a plurality of addresses, each address locating a media resource on the network;

a network server module that communicates with the network enabled device and with the memory, the network server module being able to receive a search request entered on the network enabled device that specifies one or more criteria, to select a plurality of addresses from the memory based on one or more of information that matches the one or more search criteria, and to cause the media playback component to load the media resource located by at least some of the selected addresses so that the media playback component automatically plays back media resources provided by one or more of the selected addresses; and

whereas the media playback component and the network server module constitute an integrated platform.

13. The integrated platform of claim 12, wherein the network server module communicates with the network enabled device by signaling the selected address to the network enabled device to cause the media playback component to load the media resource located by the selected address.

14. The integrated platform of claim 13, wherein the network server module communicates with the network enabled device through the network.

15. The integrated platform of claim 12, wherein the network server module is located at least partially on the network enabled device and communicates with the database through the network.

16. The integrated platform of claim 12, wherein the memory includes a database that is locatable by the network enabled device on the network.

17. The integrated platform of claim 16, wherein at least a portion of the database resides on the network enabled device.

18. The integrated platform of claim 12, wherein the network includes the internet, the network enabled device includes an Internet enabled device, each of the plurality of addresses includes links to a media web resource, and wherein the network server module signals control information to the Internet enabled device to cause the Internet enabled device to programmatically access each of a plurality of media web resources signaled to the network enabled device.

19. The integrated platform of claim 18, wherein the web server module signals control information to the media playback component and a web browser component of the Internet enabled device, to cause the media playback component of the network enabled device to programmatically load and playback the media web resource while the web browser displays a web page of a web site corresponding to the media web resource being played back.

20. The integrated platform of claim 12, wherein the media resource is a streaming media file that outputs a combination of at least video or audio once the media resource is loaded by the media playback component.

21. The integrated platform of claim 12, wherein the network server module comprises a sequence of code that is signaled to the network enabled device from another device on the network, the sequence of code being executable on the network enabled device.

22. The integrated platform of claim 12, wherein the network enabled device includes the media playback component, and wherein the network server module programmatically controls the media playback component of the network enabled device to playback the media resource.

23. The integrated platform of claim 12, wherein the network enabled device is a device selected from a group of devices consisting of a personal computer, a handheld computer, a smart network appliance, and a wireless Internet enabled device.

24. The integrated platform of claim 12, wherein the memory comprises a plurality of links to Internet sites, wherein each link accesses a media resource without requiring another internal link.

25. The integrated platform of claim 12, wherein all or a portion of the memory resides on the network enabled device.

26. The integrated platform of claim 12, wherein all or a portion of the memory is accessible to the network enabled device over the network.

27. The integrated platform of claim 12, wherein the one or more classes of information for each address in the

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database include types of metadata selected from the metadata group consisting of genre, title, and data format of the media resource.

28. A computer system for playing back media from a network, the computer system comprising:

a media playback component provided on a network enabled platform;

a database comprising a plurality of addresses, each address locating a media resource on the network, each address accessing a media resource; and

a network server module that is coupleable to the media playback component and the database, the network server module being able to receive a request for media playback from the network enabled device, to select mulliple addresses from the database, to signal the selected addresses to the network enabled device, and to control a media playback component on the network enabled device in order to cause the media playback component to sequentially play back the media resources provided by at least some of the selected addresses substantially automatically.

29. The computer system of claim 28, wherein the database comprises a plurality of links to Internet sites, wherein each link accesses a media web resource and contains no other internal link.

30. The computer system of claim 28, wherein all or a portion of the database resides on the network enabled device.

31. The computer system of claim 28, wherein the network server module resides on the network.

32. The computer system of claim 28, wherein the network server module resides on the network.

33. The computer system of claim 28, wherein at least a portion of the network server module resides on the network enabled platform.

34. The computer system of claim 28, wherein the network server module comprises a sequence of code that is signaled to the network enabled platform from another device on the network, the sequence of coda being executable on the network enabled platform.

35. The computer system of claim 28, wherein the media playback component and a network browser component arm provided on the network enabled platform, the database includes a plurality of links to media web resources, wherein the network server module programmatically controls the media playback component of the Internet enabled device in order to cause the media playback component to sequentially play back the media web resources provided by at least some of the selected addresses substantially automatically.

36. The computer system of claim 28, further comprising a web browser component provided on the network enabled device, and wherein the network server module programmatically controls the web browser component to display a web page associated with the media web resource being played back.

37. The computer system of claim 28, further comprising a play-list module coupleable lo the network server module, the play-list module generating a play-list based on one or more criteria designated by a user of the network enabled platform, the play-list including a plurality of addresses that are signaled to the network enabled platform in response to the request for media playback.

38. The computer system of claim 28, wherein the media playback component resides on a network enabled device selected from a group of terminal devices consisting of a personal computer, a handheld computer, a wireless Internet enabled device, and a handheld computer.

39. A method for playing back media on a network enabled device, the method comprising:

receiving a playback request from the network enabled device to play back media that matches one or more search criteria;

accessing a memory that includes a plurality of network addresses, the memory associating each address with one or more classes of information, each address locating a site on the network that provides access to a media resource,

selecting a plurality of addresses in the memory by comparing the one or more search criteria to the one or more classes of information associated with the plurality of network addresses; and

causing media resources, including media resources provided at sites accessed from the selected plurality of addresses, to be played back in a sequence, wherein in response to termination of playback of a given media resource in the sequence, automatically initiating playback of a subsequent media resource in the sequence.

40. The method of claim 39, further comprising signaling the selected plurality of addresses to the network enabled device.

41. The method of claim 39, wherein causing media resources to be played back in a sequence includes playing back audio from the accessed media sites.

42. A network enabled device configured to playback media from a network, the network enabled device being coupleable over to a database comprising a plurality of addresses, each address locating a media resource on a network, the network enabled device comprising:

a user-interface to prompt for a request,

a network interface to signal the request to a network server module that is communicatable with the database, and to receive one or more addresses in the database that match the search request, and

a media playback component being configured to be programmatically controllable by the network server module to automatically load the media resource associated with each address signaled to the network enabled device upon accessing the media resource, and to sequentially play back the media resources provided by at least some of the selected addresses substantially automatically.

43. The network enabled device of claim 42, wherein the user interface is controllable by the network server module after the network server module signals the response, the user-interface providing one or more prompts to enable an end user to control the media played back from the one or more media resources associated with the addresses signaled from the network server module.

44. The network enabled device of claim 42, wherein the user-interface prompts for a user to signal the network server module to immediately access a next address signaled to the network enabled device from the network server module.

45. The network enabled device of claim 44, wherein the user-interface prompts for the end user to signal the media playback component to repeat playing back a previously played media resource.

46. The network enabled device of claim 42, wherein the user interface prompts for a specific media resource from the media resources signaled from the network server module for playback, and to pause playback from the media resources signaled from the web server module.

47. The network enabled device of claim 42, wherein the network access component is a web browser residing on an Internet enabled device.

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48. The network enabled device of claim 42, wherein all or a portion of the database is accessible to the network enabled device over the network.

49. The network enabled device of claim 42, wherein all or a portion of the database resides on the network enabled device.

50. The network enabled device of claim 42, wherein the network device is Internet enabled, wherein the network interface signals the request to a web server module that is communicatable with the database to receive one or more links to web sites containing media web resources, the one or more links containing no internal links, and wherein the Internet enabled device further comprises a web browser component, the web browser component being controllable by the web server module to automatically access and display a web page associated with the media web resource being played back by the media playback component.

51. The network enabled device of claim 50, wherein the network interface includes a communication port between the network enabled device and the network.

52. A network enabled device configured to play back media from a network, the network enabled device being coupleable over the network to a database comprising a plurality of addresses, each address locating a media resource on the network, the network enabled device comprising:

a user-interface including a plurality of user-interactive features, a first user-interactive feature in the plurality of user-interactive features prompting to receive a search request for media playback;

a network interface that signals the request to a network server module upon the first user-interactive feature receiving the search request for media playback, the network interface being communicatable with the database to receive one or more addresses in the database that match the search request; and

a media playback component being configured to be programmatically controllable by the network server module to automatically load the media resource associated with each address signaled to the network enabled device upon accessing the media resource, and to sequentially play back the media web resources provided by at least some of the selected addresses substantially automatically the media playback component being controllable in playing back the media resources by one or more control user-interactive features in the plurality of user-interactive features.

53. The network enabled device of claim 52, wherein the first user-interactive feature in the plurality of user-interactive features is selected from a group consisting of selectable icons, text-entry field, and menu items.

54. The network enabled device of claim 53, wherein the control user-interactive features are selected from a group of selectable icons having functions corresponding to skipping to a next address selected to be signaled to the network enabled device, pausing the media resource being played back, repeating the media resource previously played back, and stopping playback from the media playback component.

55. The network enabled device of claim 53, wherein the user-interface includes a plurality of user-interactive features to select a characteristic for the media playback component sequentially playing back the media web resources provided by at least some of the selected addresses substantially automatically.

56. The network enabled device of claim 55, wherein the user-interface features include the plurality of user-interactive features to select a genre, an artist, or a title of a network media resource for playback.

57. The network enabled device of claim 56, wherein the search request is composed by a user selecting one or more of the user-interactive features of the user-interface.

58. A network enabled device comprising:

a media playback component configured to communicate with a network-side module to receive a first plurality of links, each of the first plurality of links locating a media file on a network, the media playback component communicating with the network-side module to sequentially play back the media web resources provided by at least some of the selected addresses substantially automatically; and

a web browser component configured to receive a second plurality of links, each of the second plurality of links hosting a media file located by one of the first plurality of links, the web browser component displaying the web site for each of the second plurality of links that corresponds to the media file being played back by the media playback component.

59. The network enabled device of claim 58, further comprising a user-interface including user-interactive features for controlling the media playback component playing back media files located by the first plurality of links.

60. The network enabled device of claim 59, wherein the user-interface is displayed in a first window, and the web browser component displays the web site for each of the second plurality of links in a second window.

61. The network enabled device of claim 60, wherein the media playback component is configured to sequentially receive the first plurality of links from the network-side module, and the web browser displays the web sites hosting media files for each of the web sites in the sequence.

62. A system for playing back media from a network, the system comprising:

means for receiving a search request from a network enabled device to play back media from multiple sites on the network, the search request specifying one or more search criteria; p1 means for accessing a memory that includes a plurality of network addresses, the memory associating each address with one or more classes of information, each addresses accessing a media resource;

means for selecting a plurality of addresses in the memory using the search criteria;

means for signaling the selected addresses to the network enabled device; and

means for causing the network enabled device to access sites located by at least some of the selected addresses and to play back the media resources provided at the accessed sites, including to sequentially play back the media resources provided by at least some of the selected addresses substantially automatically.

63. A system for playing back media from a network, the system comprising:

means for receiving a search request for playback of media from multiple sites, the search request being entered on a network enabled device;

means for accessing a memory that includes a plurality of network addresses, each address accessing a media resource;

means for identifying at least two addresses from the memory;

means for signaling each identified address to the network enabled device; and

means for causing the network enabled device to access and to sequentially play back the media resources or the

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at least two addresses, so that play back of media resources from one of the at least two addresses automatically follows termination of playback of another of the at least two addresses.

64. A method for playing back media from a network, the method comprising:

receiving a search request for playback of media from multiple sites, the search request being entered on a network enabled device;

accessing a memory that includes a plurality of network addresses, each address accessing a media resource;

identifying at least two addresses from the memory;

signaling each identified address to the network enabled device; and

causing the network enabled device to access and to sequentially play back the media resources of the at least two addresses, so that play back of media resources from one of the at least two addresses automatically follows termination of playback of another of the at least two addresses.

65. The method of claim 64, wherein causing the network enabled device to access the media resources includes signaling a uniform resource locator for each of the at east two addresses to a media playback component to cause the media resources associated with the signaled links to be accessed and played back on the network enabled device.

66. The method of claim 65, wherein receiving a search request for playback of media from multiple sires includes receiving the request for media playback from an Internet enabled device, and wherein the method further comprises signaling the uniform resource locator of the one or more media resources to a web browser component on the Internet enabled device to cause a web page corresponding to that uniform resource locator to be displayed on the Internet enabled device concurrently with the media playback component playing back the media resource accessed by that uniform resource locator.

67. The method of claim 66, wherein receiving a search request for playback of media from multiple sites includes receiving a request for a play-list comprising a plurality of addresses, the play-list arranging the plurality of addresses so that the addresses are loaded by the media playback component in a designated order, wherein identifying at least two addresses in the memory includes identifying the addresses in the play-list; and wherein causing the network enabled device to access and to sequentially play back the media resources of the signaled addresses includes accessing and playing back each media resource in the play-list sequentially in the designated order.

68. The method of claim 67, wherein receiving a search request for playback of media from multiple sites includes receiving a request for a program comprising multiple play-lists, each play-list being corresponding to a predetermined selection of media resources, wherein identifying at least two addresses includes identifying the addresses in each of the play-lists in the program, and wherein causing the network enabled device to access and automatically playback the media resource of the signaled addresses includes accessing and playing back each media resource in a sequential order designated by the play-lists of the program.

* * * * *

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,389,467 B1
DATED : May 14, 2002
INVENTOR(S) : Eyal

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page,
Item [56], **References Cited**, U.S. PATENT DOCUMENTS,

Please add U.S. reference 6,021,409.

Column 39,
Line 8, replace "tho" with -- the --.

Column 40,
Line 21, replace "internet" with -- Internet --.

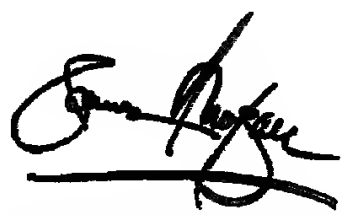
Column 41,
Lines 31-32, replace "The computer system of claim 28, wherein the network server module resides on the network" with the following claim:
-- The computer system of claim 31, wherein all or a portion of the database is accessible to the network enabled platform over the network --.
Lines 14, 16 and 18, replace each occurrence of "device" with -- platform --.
Line 42, replace "arm" with -- are --; and on
Line 46, replace "the" with -- an --.

Column 43,
Line 41, delete "web"; and on
Line 43, replace "automatically the" with -- automatically, the --.
Line 61, delete "web".

Column 44,
Lines 38, replace "criteria; p1 means for accessing a memory;" with the following:
-- criteria;
means for accessing a memory --.

Signed and Sealed this

Eleventh Day of March, 2003



JAMES E. ROGAN
Director of the United States Patent and Trademark Office

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APPENDIX D

A copy of U.S. Patent No. 5,987,103 to Martino.

US005987103A

United States Patent [19]

Martino

[11] Patent Number: 5,987,103

[45] Date of Patent: *Nov. 16, 1999

[54] **TELEPHONE/TRANSACTION ENTRY DEVICE AND SYSTEM FOR ENTERING TRANSACTION DATA INTO DATABASES**

[75] Inventor: **Rocco L. Martino**, Villanova, Pa

[73] Assignee: **CyberFone Technologies, Inc.**, Wayne, Pa.

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/909,408**

[22] Filed: **Aug. 11, 1997**

Related U.S. Application Data

[63] Continuation of application No. 08/446,546, May 19, 1995, Pat. No. 5,805,676.

[51] **Int. Cl.**[6] **H04M 11/00**

[52] **U.S. Cl.** **379/93.17**; 379/93.25; 379/93.01

[58] **Field of Search** 379/93.17, 93.25, 379/93.01, 88.18; 395/200.31, 200.33; 364/400; 348/13, 14; 381/110

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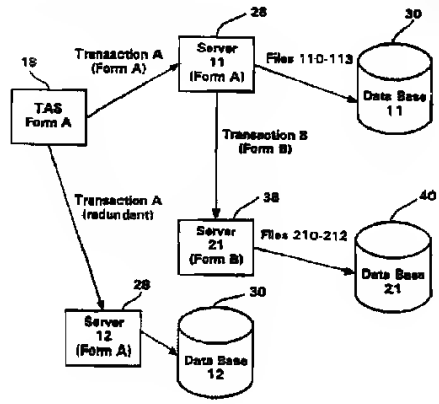
Primary Examiner—Curtis A. Kuntz
Assistant Examiner—Melur Ramakrisnaah
Attorney, Agent, or Firm—Woodcock, Washburn Kurtz Mackiewicz & Norris LLP

[57] **ABSTRACT**

A data transaction processing system in which transaction data is entered by the user in response to prompts in a template which is tailored to each user application. The template and entered data are accumulated into data transactions which are immediately transmitted upon completion to an external database server for processing and storage. The data transactions are not locally stored for processing, and no conventional operating system is necessary. No local processing needs to be provided, and the only local storage is a flash PROM which stored the control firmware, a flash memory which stores the data streams making up the forms and menus, and a small RAM which operates as an input/output transaction buffer for storing the data streams of the template and the user replies to the prompts during assembly of a data transaction. The data transaction is received via standard protocols at a database server which, depending upon the application, stores the entire data transaction, explodes the data transaction to produce ancillary records which are then stored, and/or forwards the data transaction or some or all of the ancillary records to other database servers for updating other databases associated with those database servers. Also, in response to requests from the transaction entry device, the database server may return data streams for use in completing the fields in the data transaction or in presenting a menu on the display which was read in from the database server or a remote phone mail system. The transaction entry device is integrated with a telephone and is accessed via a touch screen, an optional keyboard, a magnetic card reader, voice entry, a modem, and the like.

53 Claims, 12 Drawing Sheets



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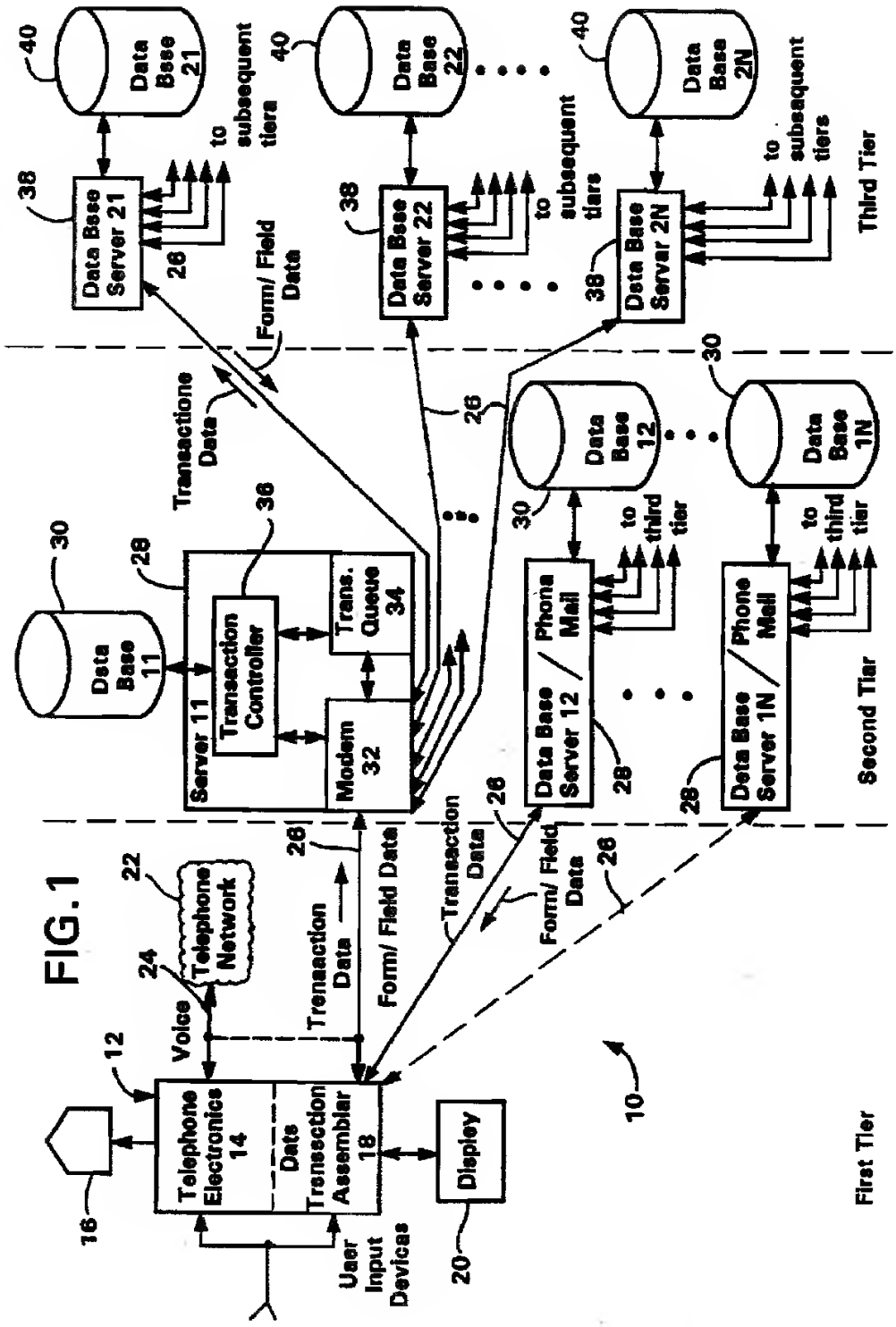

FIG. 1

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FIG.2

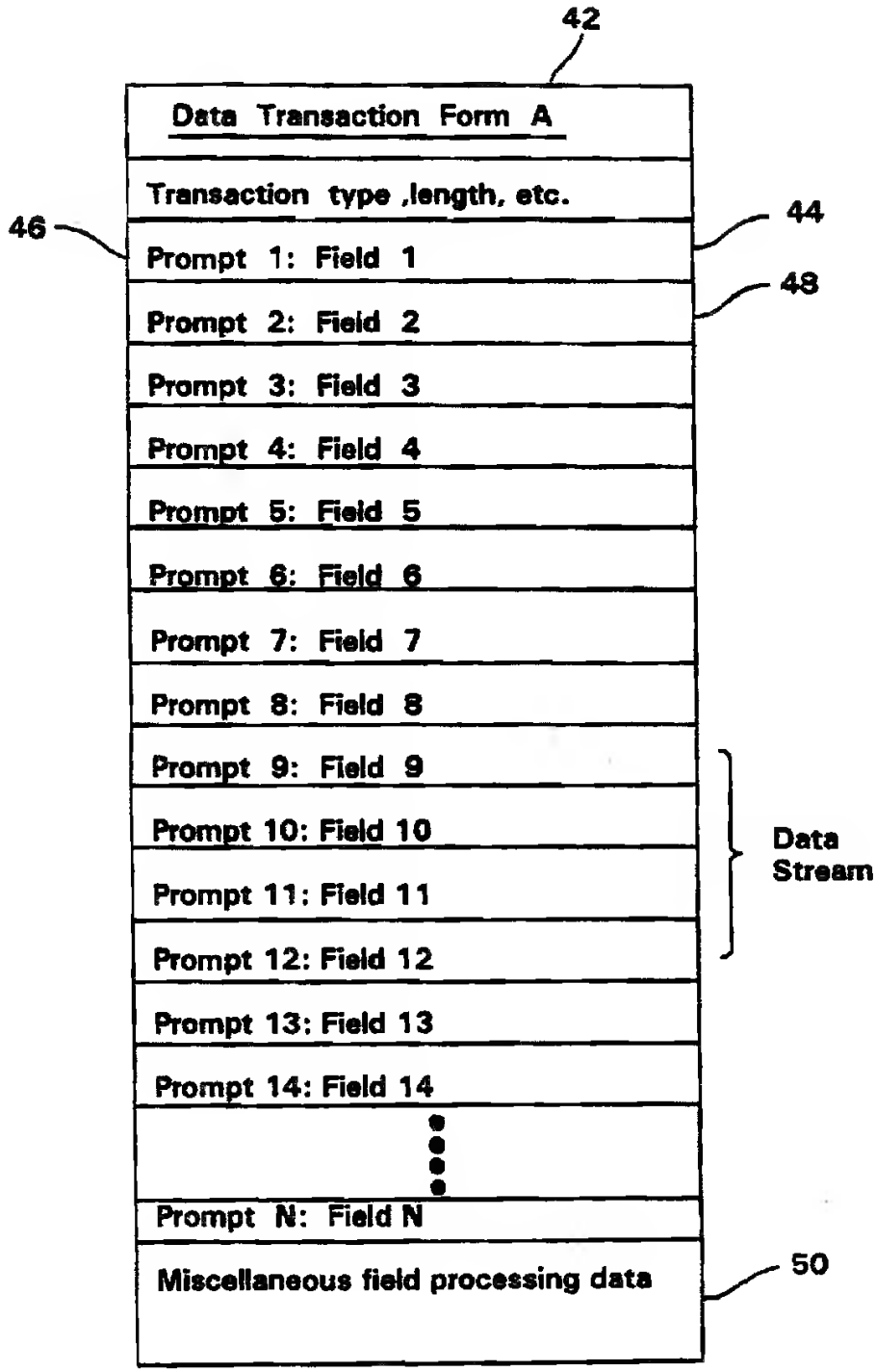

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FIG.3

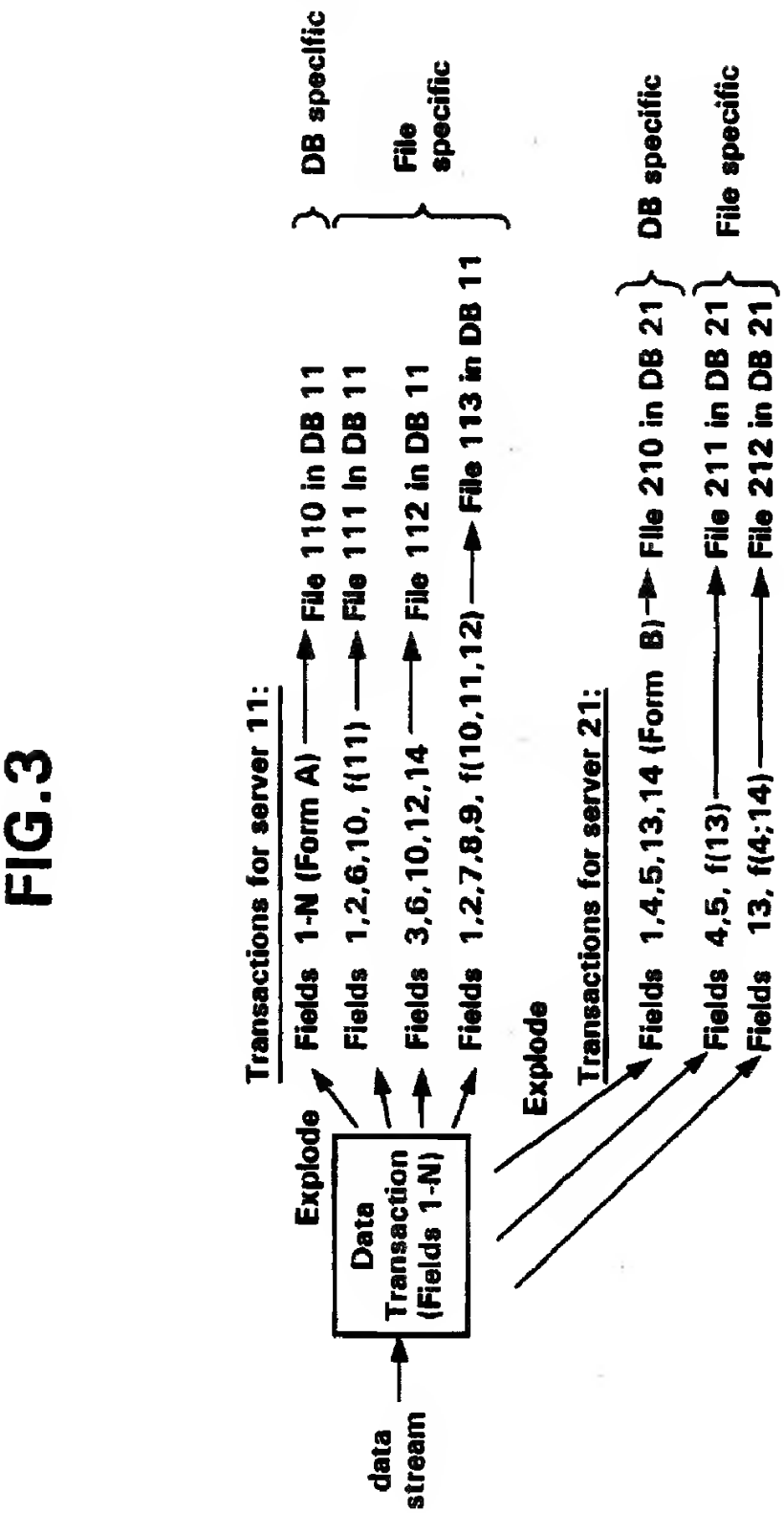

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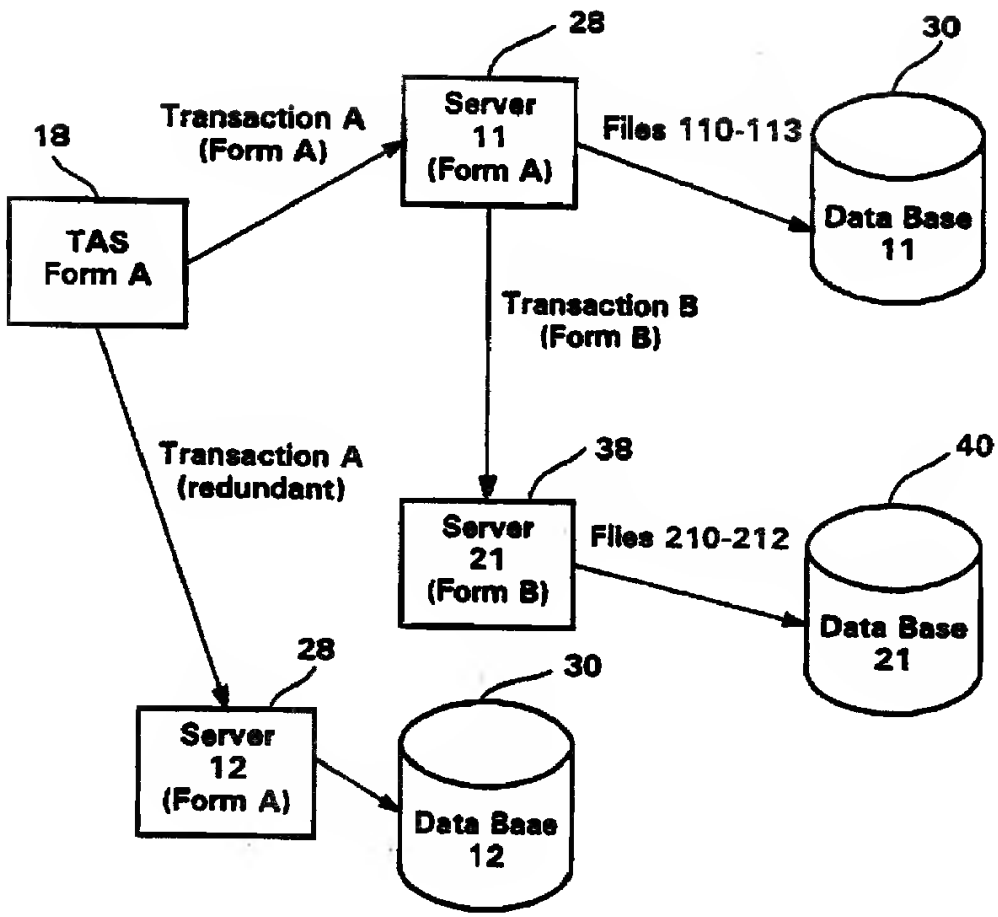
FIG.4



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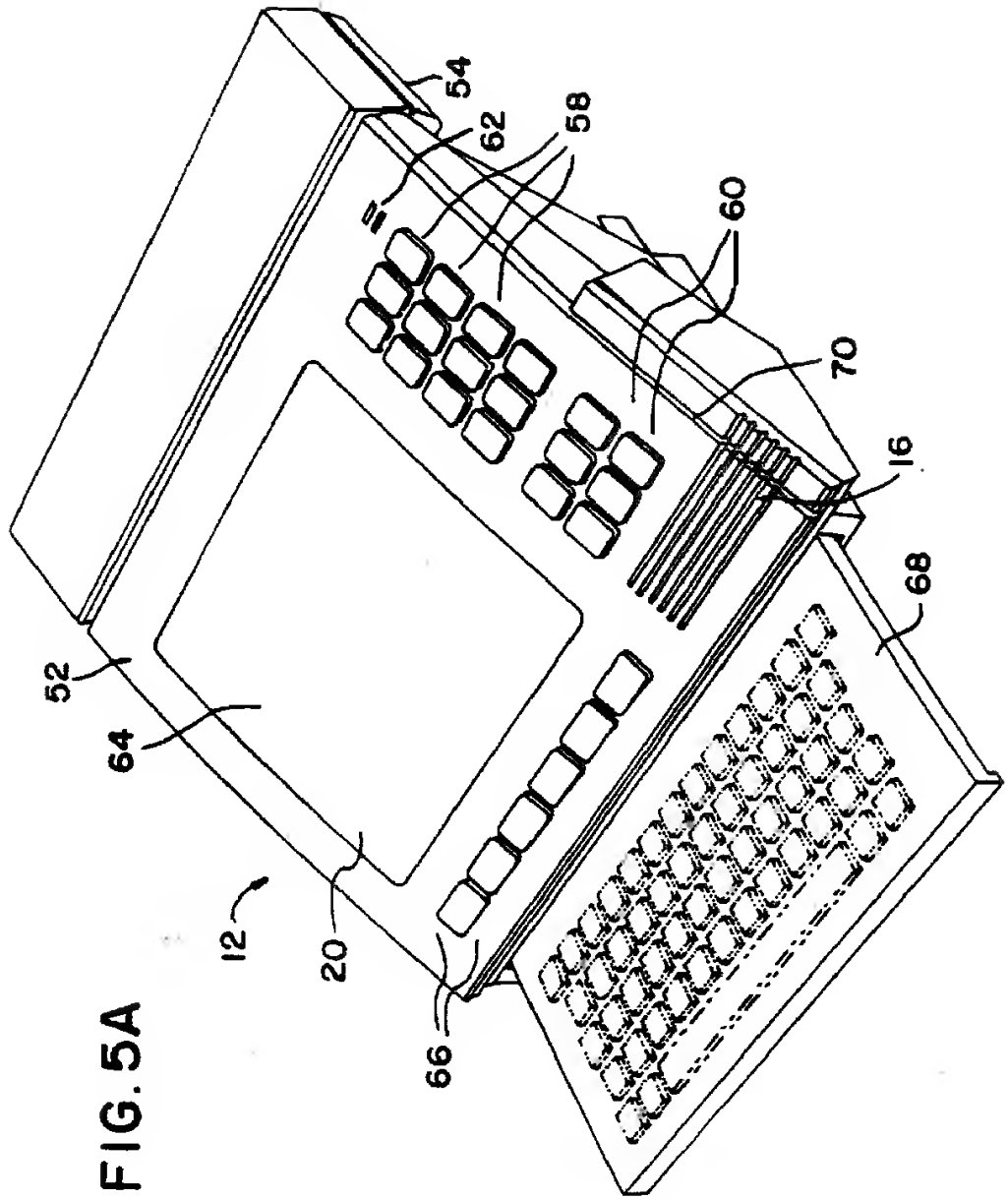

FIG. 5A

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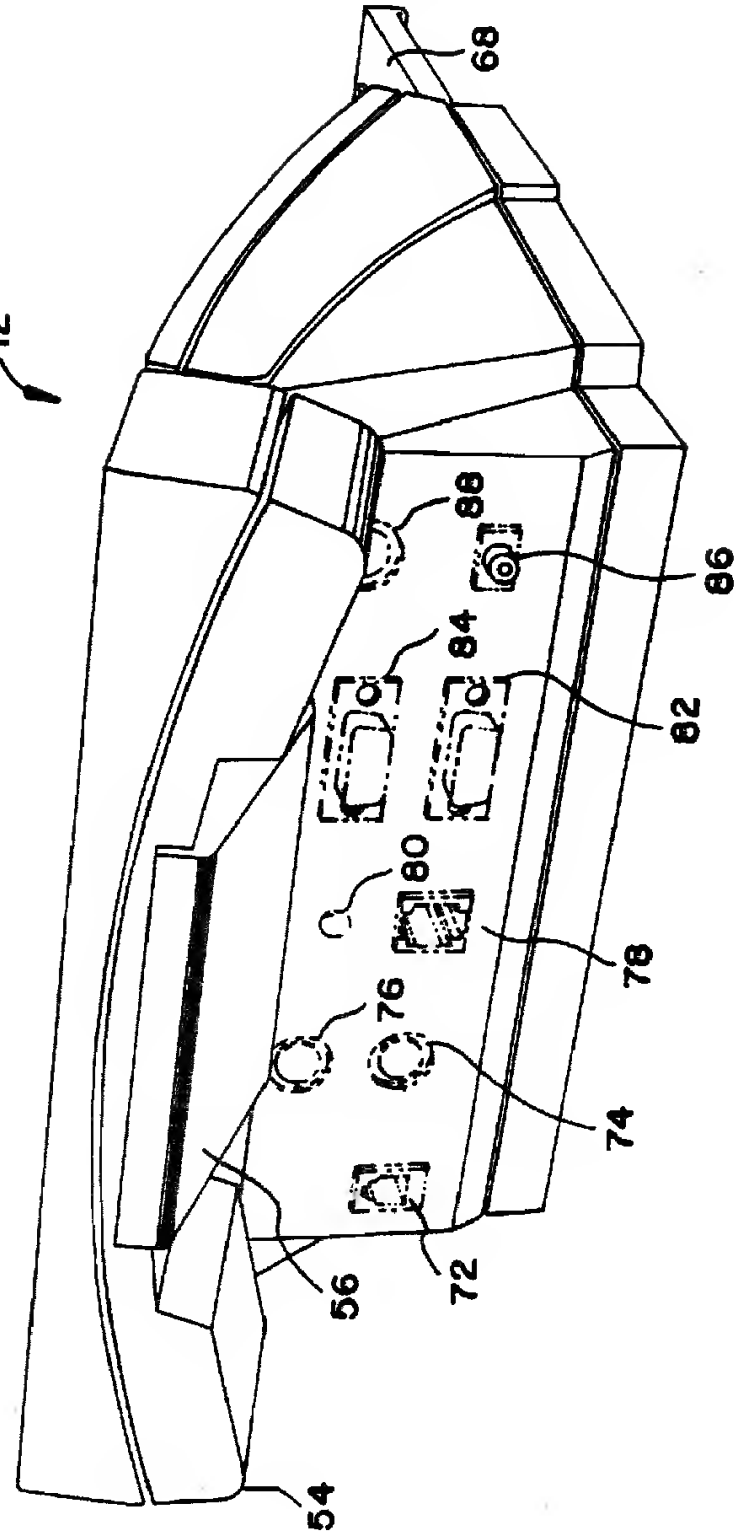

FIG. 5B

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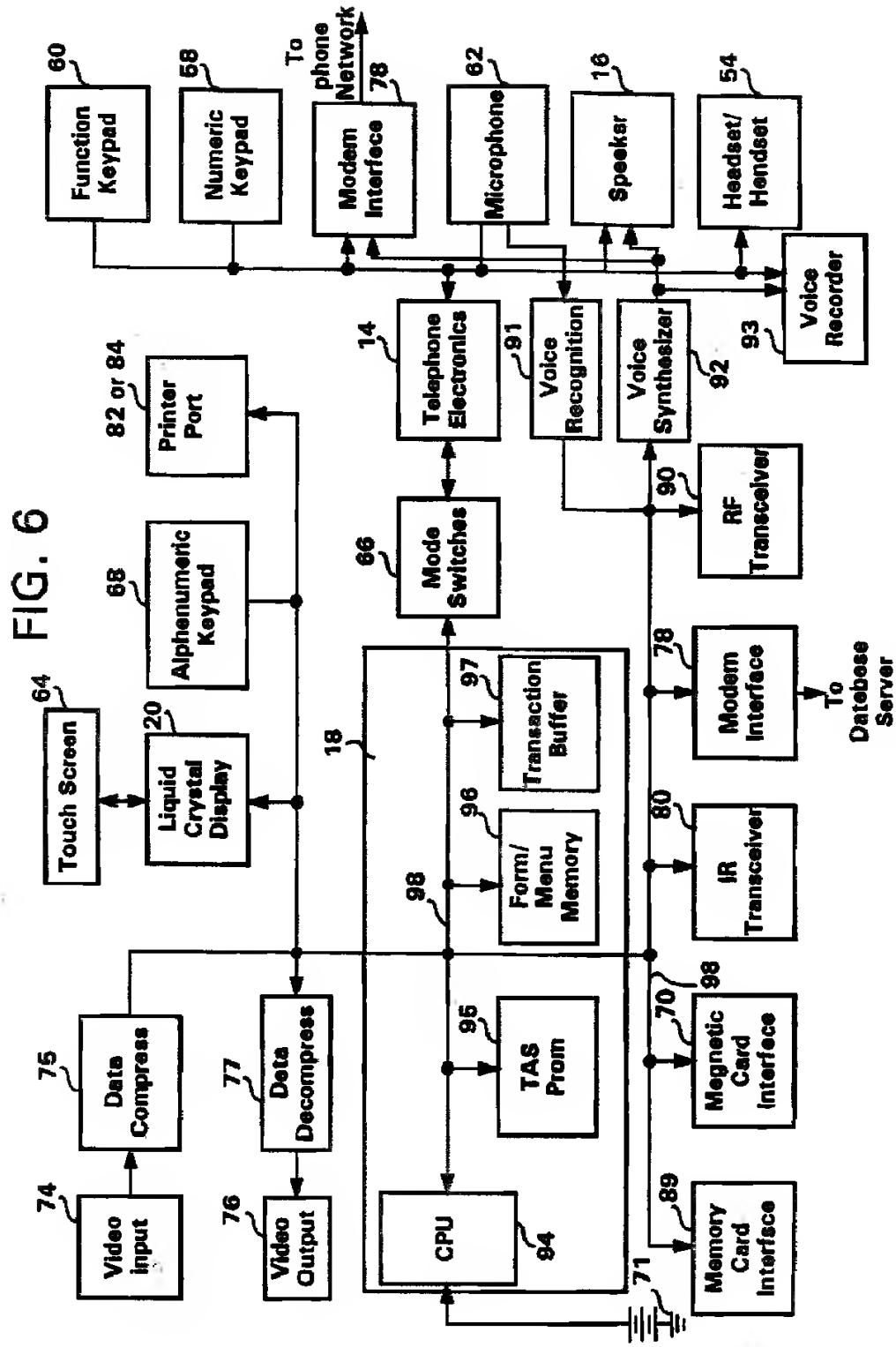

FIG. 6

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FIG. 7

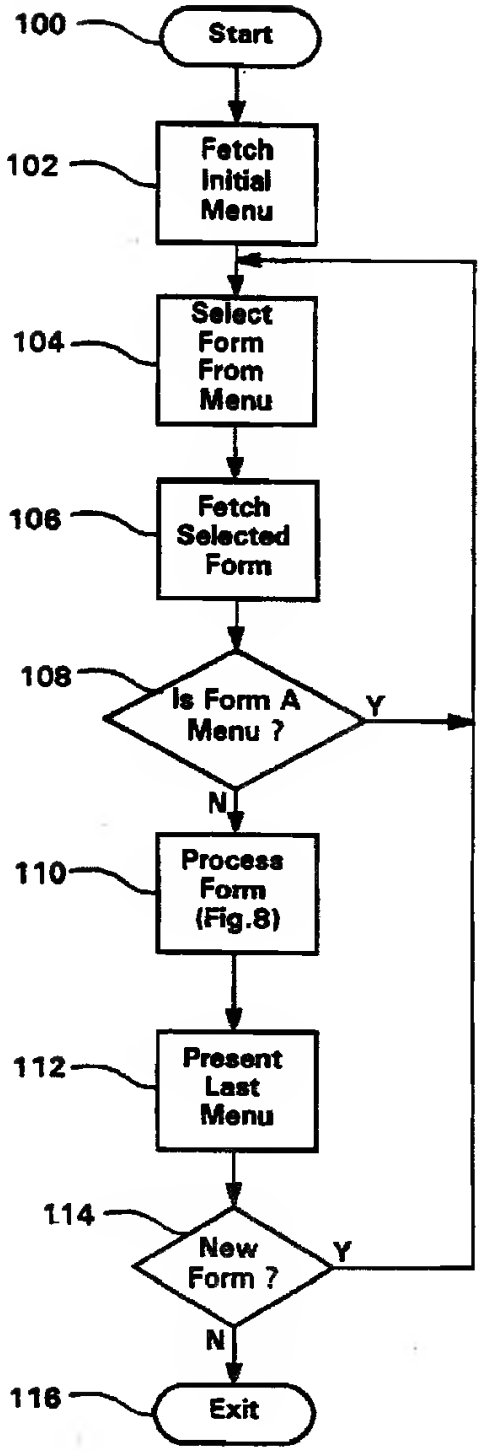

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FIG.8

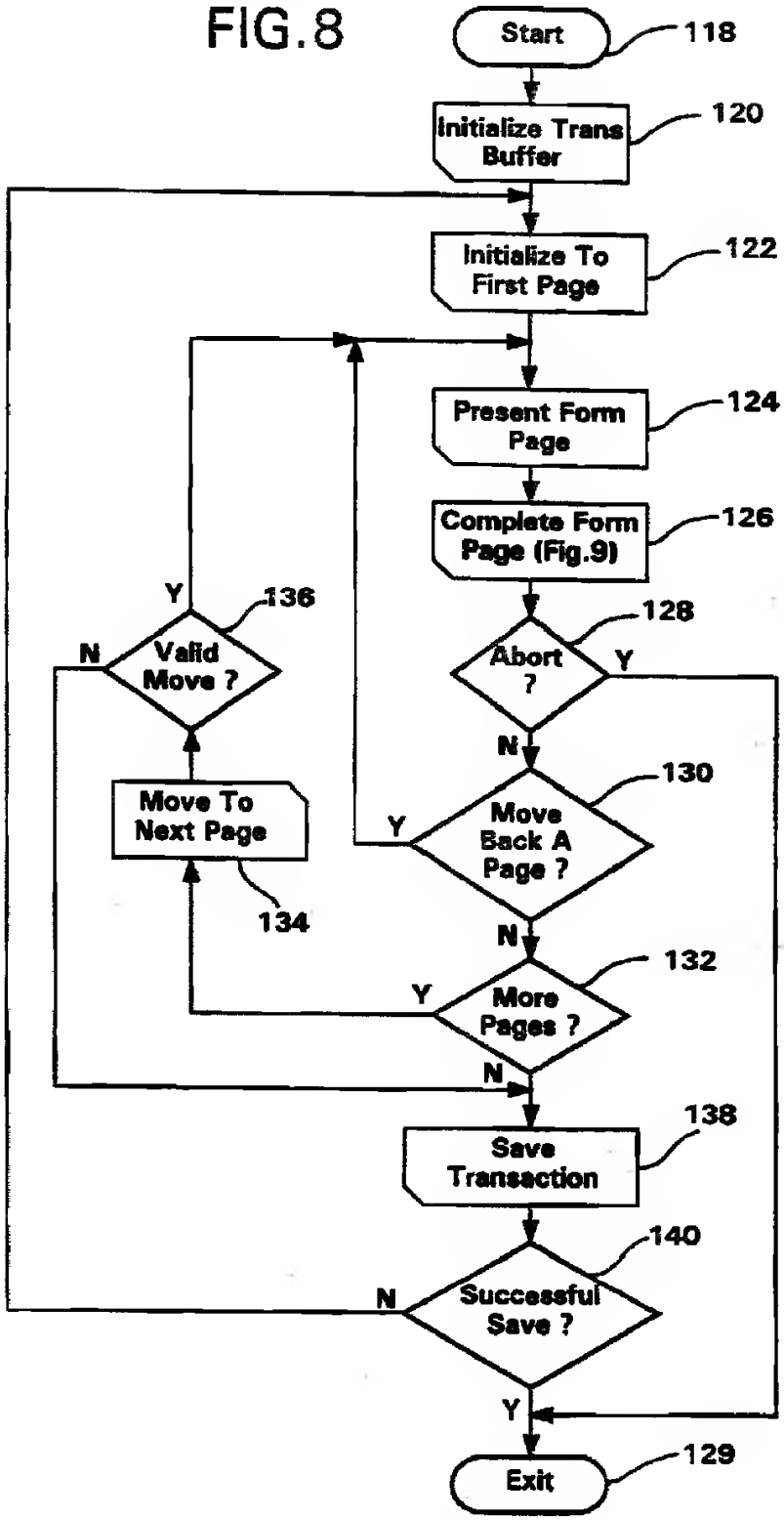

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FIG.9A

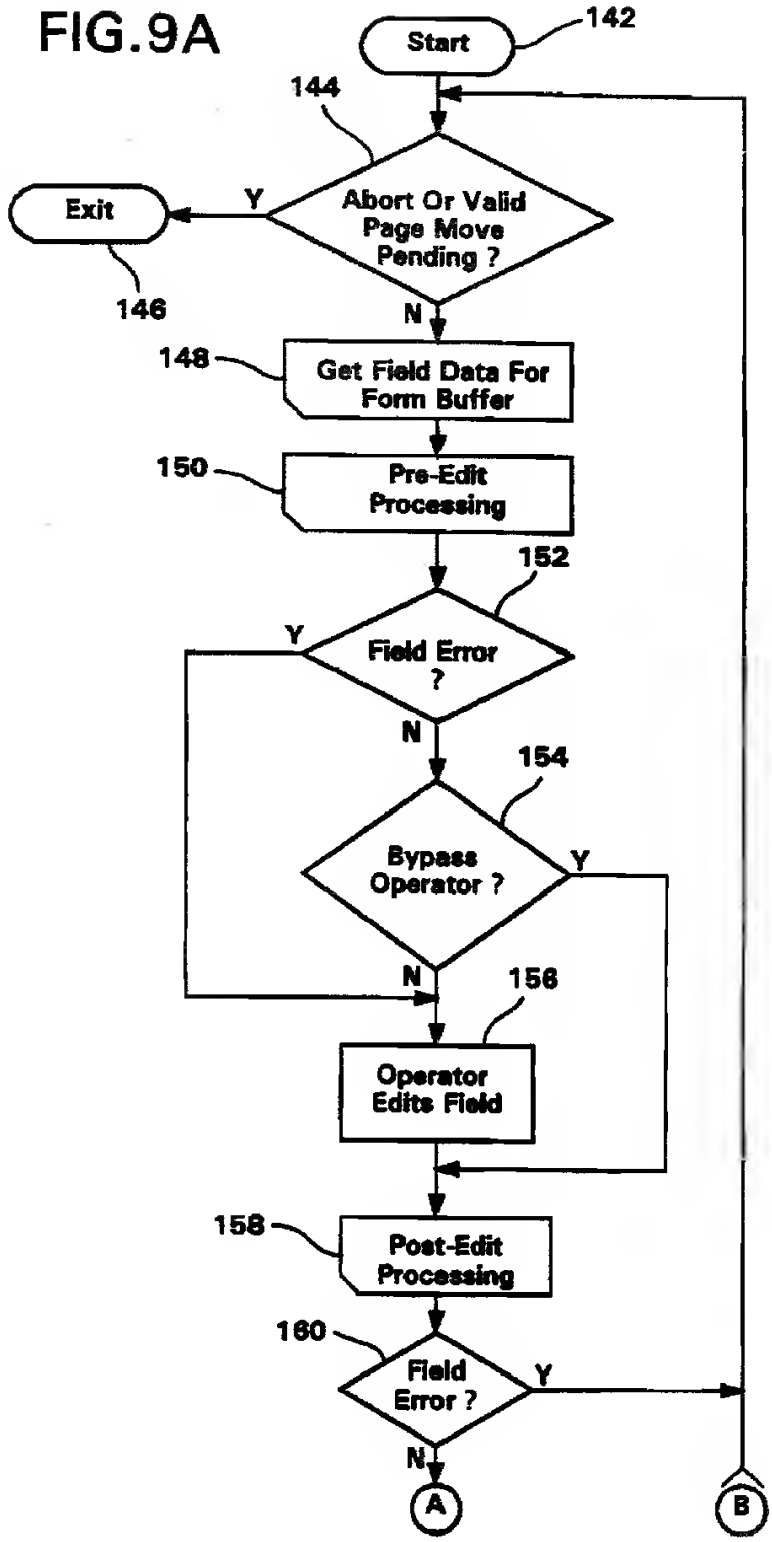

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FIG.9B

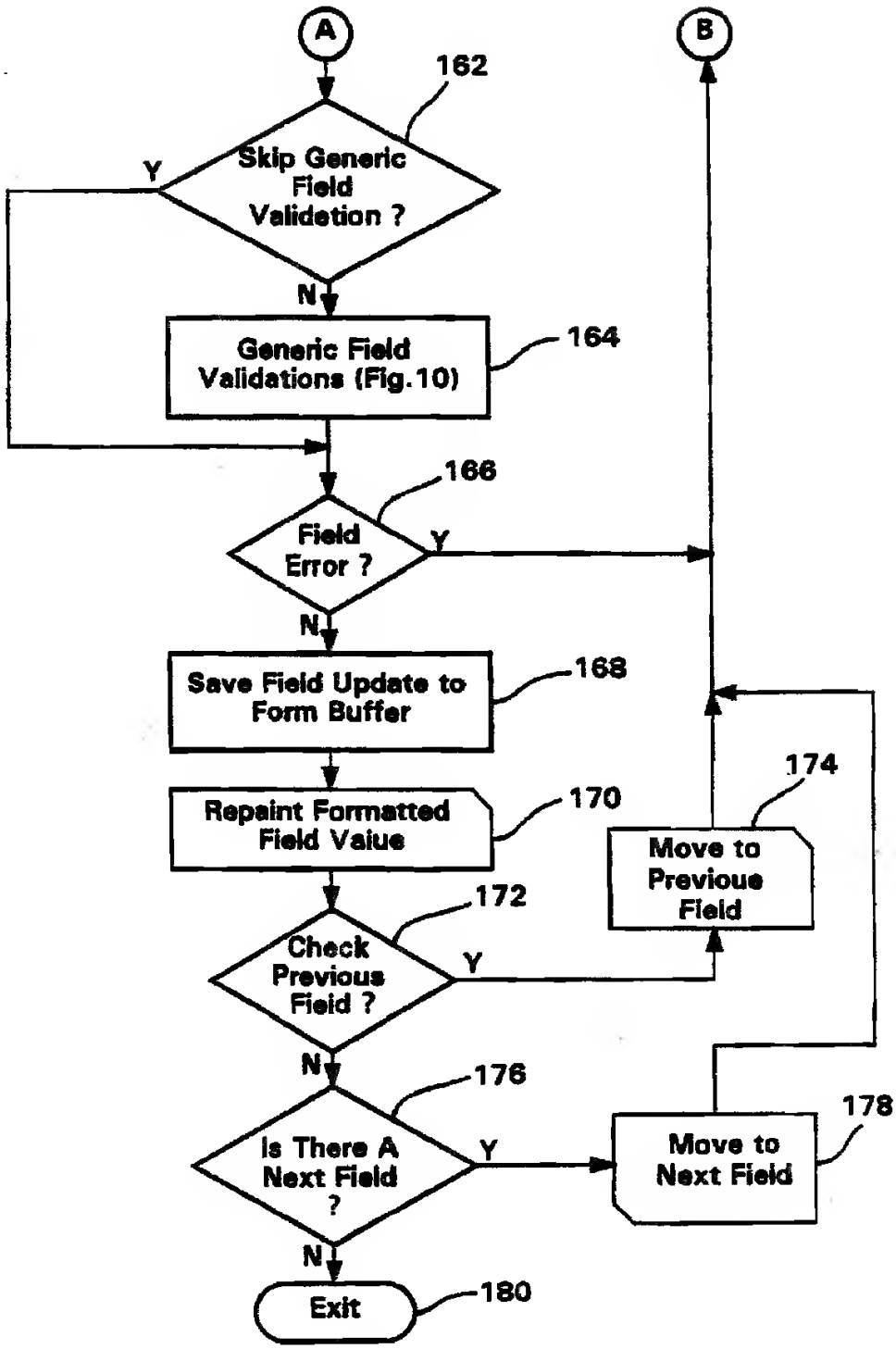

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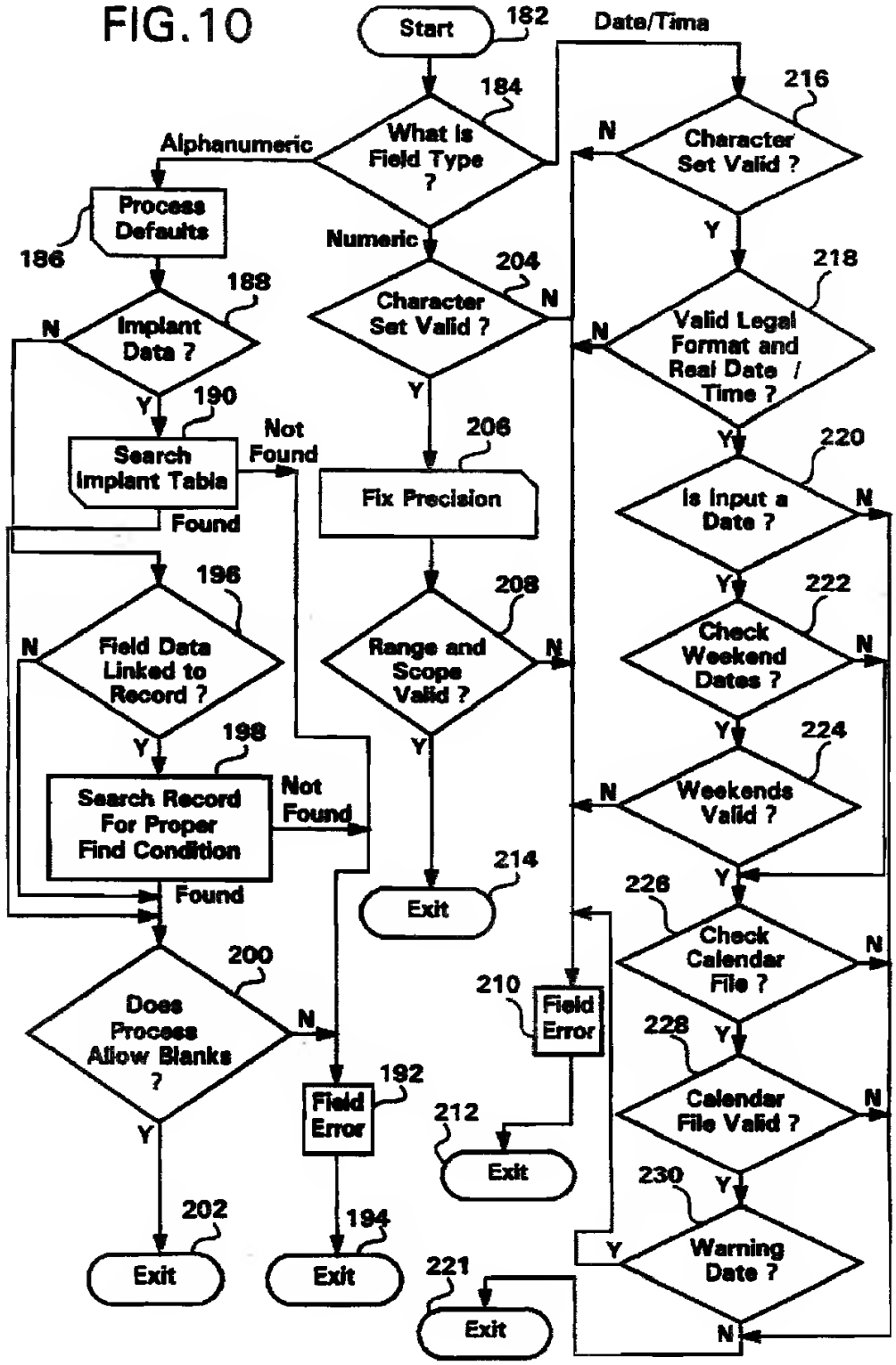
FIG. 10



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TELEPHONE/TRANSACTION ENTRY DEVICE AND SYSTEM FOR ENTERING TRANSACTION DATA INTO DATABASES

This is a continuation, of application Ser. No. 08/446,546, filed May 19, 1995, U.S. Pat. No. 5,805,676 the disclosure of which is herein incorporated by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a system for automatically capturing data at the point of transaction and storing that data in the appropriate database(s), and more particularly, to a data transaction processing system including a transaction entry device which can selectively operate in a telephone mode and a transaction entry mode. In the telephone mode, the transaction entry device operates as a conventional telephone. However, in the transaction enlry mode, menus are used to navigate the user to forms which facilitate the entry of data. The entered data and forms together form data transactions which are transmitted to one or more databases for processing and storage. The database (s) also "explodes" the data transactions into their component parts and transmits those component parts to still other databases for processing and storage so that the data in the data transactions automatically updates all current database items affected by such data.

2. Description of the Prior Art

The telephone has become an increasingly versatile instrument. The functionality of telephones has been expanded by incorporating the functions of answering machines, facsimile machines, and the like. Point-of-entry systems have also been developed which incorporate computer processing capabilities into conventional telephones. For example, a computer/telephone apparatus is described in U.S. Pat. Nos. 5,195,130, 5,008,927, and 4,991,199 which configures a telephone as a programmable microcomputer which is operated through the standard telephone 12-key keypad. A programmable gate array is reconfigured to accommodate various types of software which require different hardware configurations but without actually reconfiguring the hardware. The reconfiguration data is received from a network host computer and is used by the programmable microcomputer to emulate the hardware of any of a plurality of service bureaus which communicate with the network host computer. In this manner, the telephone/computer is configured to communicate data to/from any of a number of different service bureaus via conventional telephone lines.

However, telephone/computer systems of the type described in the afore-mentioned patents are typically quite complicated and expensive and are limited by the types of operating software which can be downloaded from the network host computer. Also, such telephone/computer systems are relatively slow since the microcomputer must be reconfigured before it will permit communication with the requested service bureau. Because of these characteristic features, such telephone/computer systems are typically used in public locations and are not efficient for creating point-of-entry transactions in typical commercial or private settings. A point-of-entry transaction system is desired which does not have such limitations and which is operating system independent.

Elimination of the requirement of a conventional operating system and the associated application programs for the microcomputer of a data entry device would greatly decrease the cost of such a device. However, to date, this has not been possible because the operating system is needed to run the application programs which control the data communications and together handle discrete parts of the system. Unfortunately, such application programs require substantial amounts of local memory and substantial processing power for performing the desired functions. Also, the operating systems themselves tend to be quite costly to purchase and maintain.

Accordingly, a data entry system is desired which does not have the inherent limitations of conventional point-of-entry systems such as the requirement of a standard operating system for communication with a remote service bureau or file server. A data entry device and associated system is desired which performs a minimal amount of processing at the data entry device so that the data entry device may be as simple and inexpensive as possible, thereby bringing the cost of such a device into a range suitable for most commercial and private uses. It is also preferable that such a data entry device provide a wide range of functionality without requiring a local operating system program and a plurality of applications programs for implementing each function. The present invention has been designed to meet these needs.

SUMMARY OF THE INVENTION

The system which meets the above-mentioned needs in the art includes a transaction entry device that permits the user to organize and control all aspects of his or her personal transactions as well as any transactions that may occur in an office setting. In its simplest terms, the transaction entry device formats input data into a data transaction having content which is dependent upon the type of application to which the associated data pertains. These data transactions are then transferred to a local or remote database server which "explodes" each data transaction into its component parts for uplating all databases containing data to which the data in the component parts pertain. In this "transaction entry mode" the transaction entry device of the invention functions as a multi purpose workstation. However, since the data transactions are created without the use of an operating system or application programs, the transaction entry device is quite simple and inexpensive and may be readily integrated with the customer's desktop telephone or portable telephone.

The present invention combines computer technology and telephone technology to allow transaction data to be captured at the point of initiation of the transaction. The transaction entry device is integrated into a conventional telephone which acts as either a normal telephone in a telephone mode or as a transaction entry device in a transaction entry mode. When in telephone mode, the telephone operates in a conventional manner. However, when in transaction entry mode, the transaction entry device is driven by a microprocessor which is, in turn, driven by an operating system independent transaction assembly (or application) server (TAS) comprised of data streams stored in a flash PROM. The TAS is absolutely self-contained in its relationship to the hardware of the transaction entry device and in general performs the two basic functions of (1) generating a template or form from a data stream and (2) developing a data transaction as the user inputs data in response to prompts in the template or form. The template is a series of data streams read from a local flash memory or transmitted directly from an external source such as a database file server.

During operation, the data entered by the user in response to prompts in the template are accumulated into data trans-

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actions which are immediately transmitted to an external database server. Unlike typical prior art systems, the data transactions are not locally stored for processing by the local microprocessor once the data transaction has been completed. On the contrary, the only required storage in the transaction entry device is a flash PROM for storing the TAS firmware, a flash memory for storing the data streams used by the TAS firmware to complete a form and the modem numbers for the remote database servers, and a small RAM which operates as an input/output transaction buffer for storing the data streams of the template and the user replies to the prompts in the template during assembly of a data transaction. The transaction buffer(s) only needs to be as large as the largest data transaction since it only stores the form until the entire data transaction is completed. In this sense, the transaction entry device serves as an assembly point for specific transactions until they are ready for transmission to an external database server for processing and storage.

The data transaction formed by the transaction entry device is transmitted via modem to a local or remote database server for processing and storage. The data transaction is received via standard protocols at the database server which, depending upon the application, stores the entire data transaction, explodes the data transaction to produce ancillary records which are then stored, and/or forwards the data transaction or some or all of the ancillary records to other database servers for updating other databases associated with those database servers. Also, in response to requests from the transaction entry device, any of the database servers may send data streams back to the transaction entry device for use in completing the fields in the data transaction or in displaying new forms or menus for selection.

Thus, the data transaction system of the invention comprises at least three tiers: a first tier for capturing the data transaction from the user, where the data transaction has a one-to-many relationship to file structures, a second tier for exploding the data transaction into its component parts on a system-specific basis so that each component part has a one-to-one correspondence with a file, and a third tier for providing additional explosions of the data transactions on an application-specific basis so that each application has its own set of data transactions.

A preferred embodiment of the transaction entry device of the invention resembles a conventional telephone except that it includes a touch screen and an optional keyboard for data entry in addition to the conventional numeric and function keypad inputs. A telephone handset or headset is optional and may be replaced by a microphone and speaker. The transaction entry device of the invention also includes RS-232 and other input/output ports for accommodating other options such as a wireless (RF) receiver, a magnetic card and/or smart card reader, a video camera and video display, infrared controllers, and the like. The telephone preferably has normal touch-tone functions as well as mobile and cellular options.

Preferably, the transaction entry device contains a microprocessor such as an Intel 80386SX or higher, one megabyte of flash memory for dynamically storing the data streams for the templates, one megabyte of flash PROM for storing the TAS firmware, and a 128 kB RAM which functions as a transaction buffer for storing the data streams of the templates and the user responses until completion of the data transaction. A graphics display screen is also provided for displaying the templates to the user for the entry of the data which will form the data transactions. Preferably, the graphics display screen is on the order of 24 lines by 40 characters for a desktop unit and 12 lines by 40 characters for a cellular unit.

The transaction assembly (application) server (TAS) guides the user to the desired template via menu selections, where the menus and templates are stored in flash memory as data streams and are called up by the TAS firmware when selected by the user. Generally, the menus are treated as a special type of template or form. The templates stored in the flash memory may be updated at any time to handle particular applications by reading in a new data set which has been created off-line and downloaded via modem or direct connection to the flash memory of the transaction entry device. Alternatively, the data may be downloaded to an RS-232 input. The same connections may be used to provide an automatic read from a remote database or an automatic write to a remote database. New applications may be added simply by adding additional flash memory elements containing the necessary templates for the new application.

The telephone/transaction entry device and the associated system for storing transaction data in accordance with the invention is unique in that it separates the user from the database and provides a simple, user friendly way to enter transaction data without requiring a local operating system to run various application programs. Since all data is entered as data transactions determined by templates tailored to particular applications, the user applications may be generalized so that no unique user application programs need to be written when a new application is added. However, if code is needed, or if a multimedia element is to be included in a data transaction, it can be appended to a data transaction as an additional parameter stream in the stream of data forming the data transaction. Also, since the nature of the data in the respective fields of the templates for particular applications is known in advance, the interface to a database server to permit storage of the data transactions and their component parts in the appropriate databases in the appropriate formats for each database becomes trivial.

In an alternative implementation of the invention, a process may be selected from the menu of the transaction entry device which creates a "visible" menu corresponding to a voice mail menu of a remote phone mail system. When such a process is selected, the telephone or modem interface makes a telephone connection to the remote phone mail system, and, once the connection is made, the data transaction assembler sends a data request for a visual representation of the phone mail menu of the remote phone mail system via the telephone connection to the remote phone mail system. A data stream containing the visual representation of the phone mail menu from the remote phone mail system is then returned via the telephone connection and stored in a memory of the transaction entry device for presentation to the display screen of the transaction entry device 12. When the desired phone mail menu option is selected from the "visible" voice mail menu, the data transaction assembler creates a data transaction indicating which menu item was selected and sends the data transaction to the remote phone mail system via the telephone connection. Based on the menu selection, the remote phone mail system then returns a data stream containing a visual representation of the next phone mail menu via the telephone connection for storage and display. This process is repeated until the calling party is required to leave a message or the called party is reached.

BRIEF DESCRIPTION OF THE DRAWINGS

The above-mentioned characteristic features of the invention will become more apparent to those skilled in the art in view of the following detailed description of the invention, of which:

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FIG. 1 is a schematic diagram of a system for entering data transactions into databases in accordance with the invention.

FIG. 2 illustrates a generic template for use in creating a data transaction in accordance with the invention.

FIG. 3 illustrates an "exploded" data transaction in which the component parts of a data transaction are stored in database-specific and file-specific locations.

FIG. 4 illustrates the "exploded" transaction of FIG. 3 in the context of the system illustrated in FIG. 1.

FIGS. 5(*a*) and 5(*b*) together illustrate a preferred embodiment of a transaction entry device in accordance with the invention.

FIG. 6 is a schematic diagram of the electronics of the transaction entry device illustrated in FIGS. 5(*a*) and 5(*b*).

FIG. 7 is a flow diagram of a menu driven transaction assembly (application) server (TAS) in accordance with the invention.

FIG. 8 is a flow diagram illustrating a technique for processing a form used to form a data transaction in accordance with the invention.

FIGS. 9(*a*) and 9(*b*) together illustrate a flow diagram of a technique for completing and editing a data transaction in accordance with the invention.

FIG. 10 is a flow diagram illustrating how the TAS validates the fields of each data transaction.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENT

A system and method which meets the above-mentioned objects and provides other beneficial features in accordance with the presently preferred exemplary embodiment of the invention will be described below with reference to FIGS. 1–10. Those skilled in the art will readily appreciate that the description given herein with respect to those figures is for explanatory purposes only and is not intended in any way to limit the scope of the invention. For example, those skilled in the art will appreciate that the telephone/transaction entry device and system for entering data transactions into remote databases in accordance with the invention may be used in numerous settings in numerous applications. Accordingly, all questions regarding the scope of the invention should be resolved by referring to the claims.

A. SYSTEM DESCRIPTION

1. Overview

The system of the invention provides for the automatic capture and computerization of data associated with data transactions as they occur. As used herein, a data transaction is the combination of a form or template or a series of forms or templates containing data entry prompts and the data entered in response to those prompts. Throughout the remainder of this specification, the words "form" and "template" will be used interchangeably.

The data transactions are generated by a transaction entry device through an interactive process between the user and the form. The data transaction is assembled in a transaction buffer in the data transaction entry device and then transmitted to an external database for storage. No local storage for data transactions is available. The data transaction is defined externally by the database in that all applications consist of a series of customized forms and prompts for soliciting entry of the data needed to update the databases containing data related to the particular application. Generally, the data transaction will have a one-to-many relationship to the file structures of the database containing data for that application.

The data transactions are entered using the transaction entry device. Preferably, the transaction entry device is integrated with telephone electronics so that the resulting device may selectively operate as a conventional telephone or as a data transaction entry device. The resulting transaction entry device preferably includes a touch screen and/or keyboard which provides input to a transaction assembly (application) server (TAS) which, in turn, presents selection options via menus and forms for completion by the user. Menu and form selection and form completion is made by touch, by key selection from the keyboard, by moving a cursor to the appropriate selection point and depressing a key, or even by voice command. Whenever data entry (other than mere selection) is desired, it is accomplished via a menu-driven selection process and/or by direct entry of data using a keyboard, a keypad, a touch screen, and the like. In the menu-driven case, a set of options is presented to the display screen by the TAS firmware. If this set of options exceeds the capacity of the display screen, then the list is scrolled up or down through the use of scroll keys on the device, by voice command, or by touch at scroll command points. Once the selection is made, the data associated with that selection is automatically entered into the form from a local or remote database, or the data is input by the user. In the event of keyboard entry, the TAS firmware may present a keyboard at the bottom of the display screen for touch entry; alternately, an optional keyboard located at the base of the transaction entry device may be used.

When the data is entered independently of a selection process, such data also may be entered using a swipe card if the data resides on the swipe card or the data may be transferred into the data transaction via modem from an external source. The data read from the swipe card can be used to fill out a form or may be transmitted to an external database or computer. Data returned from the external database or computer via modem may also be used to fill out the fields in the form. As desired, the data in a data transaction may also be written to a swipe card or memory card and the like.

The TAS firmware of the invention stores the options as well as control programs (microcode) for the processor for use with the templates in creating the data transactions. The TAS firmware also includes a program allowing connection via modem to one or more external computers and databases. Preferably, two modes of operation are available: transaction entry mode (with or without modem connection) and telephone mode. A selection of either the transaction entry mode or the telephone mode is made through a switch selection on the transaction entry device.

When the transaction entry device is placed in the transaction entry mode, the TAS firmware immediately presents a selection menu for all of the options the system is programmed to handle. In the telephone mode, on the other hand, a dial tone is provided and the telephone keypad is enabled. In telephone mode, one or more lines may be connected so as to allow simultaneous use of the transaction entry device without interfering with the modem connection. However, if a single telephone line is used, the telephone capability is available at all times or intermittently via modem as specified by the particular application. In the intermittent mode, upon a "save" the transaction entry device will control a dial up and transfer of data to a remote database server. On the other hand, if the telephone is used with an automatic dialer mechanism utilizing a phone list,

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the transaction entry device may automatically change from the telephone mode to the transaction entry mode. In this case, a display on the telephone may be used to present a name and telephone list from which a selection can be made in accordance with the menu selection techniques described below.

2. Data Transaction System (FIGS. 1–4)

FIG. **1** is a schematic diagram of a system **10** for entering data transactions into databases in accordance with the invention. As illustrated, system **10** comprises a first tier for capturing a data transaction having a one-to-many relationship to file structures, a second tier for exploding the data transaction into component parts having a one-to-one relationship to file structures, and a third tier for providing additional explosion of the data transactions for specific applications.

The first tier comprises a transaction entry device **12** which captures the data transaction from the user in response to any of a plurality of inputs from the user. Transaction entry device **12** includes conventional telephone electronics **14** and speaker **16** and a data transaction assembler **18** for creating a data transaction in accordance with the invention. A display screen **20** is preferably associated with data transaction assembler **18** so that the user may monitor creation of each data transaction. Telephone electronics **14** are connected to a telephone switching network **22** via a conventional voice connection **24** over the telephone lines, while data transaction assembler **18** is connected via telephone lines **26** to one or more database servers **28**. As illustrated in FIG. **1**, telephone lines **24** and **26** may be separate lines, thereby permitting simultaneous use of the telephone and data entry functions, or the telephone electronics **14** and data transaction assembler **18** may be connected to a single line as illustrated in phantom in FIG. **1**. Of course, when the telephone electronics **14** and data transaction assembler **18** are connected to a single line, a mode switch will enable their mutually exclusive operation, or alternatively, any of a number of conventional transmission schemes may be used to permit simultaneous transmission of the voice from the telephone electronics **14** and the data from the data transaction assembler **18** over the same line.

During operation in the transaction entry mode, transaction entry device **12** is responsive to user input devices such as a touch screen, a telephone keypad, a keyboard, a microphone, a swipe card, a memory card, video input, and the like, to form data transactions using data transaction assembler **18**. Alternatively, the transaction entry device **12** operates in a telephone mode as a conventional telephone and receives inputs from a microphone and/or a handset, a touch tone keypad, and the like. More details of the transaction entry device **12** and data transaction assembler **18** will be provided in the next section with respect to FIGS. **5–10**.

The second tier comprises one or more database servers **28** and their associated databases **30**. In general, each database server **28** receives data transactions from one or more transaction entry devices **12** and "explodes" the received data transactions into their component parts for storage in the appropriate files of the associated database **30**. In other words, the one-to-many file structure of the data transactions from one or more transaction entry devices **12** is converted into many one-to-one data transactions for storage in individual files of database **30**.

Each database server **28** includes a modem **32** for transmitting/receiving data from the telephone lines **26**, particularly the data transactions from one or more transaction entry devices **12**. Preferably, the data transactions are transmitted over the telephone lines **26** as data packets having, for example, 128 bytes, where 120 bytes contain information and 8 bytes contain control data. A transaction queue **34** acts as an input buffer for the received data transactions and controls the rate of presentation of the data transactions to transaction controller **36**. Transaction controller **36** processes the received data transactions to extract the physical file relationships of the component parts of the data transactions and stores the components parts and different combinations thereof in the appropriate files of associated database **30**. Alternatively, transaction controller **36** may process a data request from data transaction assembler **18** requesting information from database **30** for completing certain fields of a data transaction being processed by the transaction entry device **12**. Database **30** then provides the requested information to database server **28** which, via modem **32**, provides a data stream back to data transaction assembler **18** for use in completing the data transactions or presenting additional menus and forms in accordance with the invention. Typically, a user ID and password are transmitted to the transaction controller **36** to permit a connection to be made by data transaction assembler **18**. Thus, transaction controller **36** also checks and stores startup and logoff information in addition to storing data transactions and directing reconstituted data transactions to other database servers as described herein. In addition, database server **28** may include a conventional phone mail system with an associated database for storing voice mail messages. In this case, the data transaction may include voice data for storage in the remote voice mail system.

As shown in FIG. **1**, several database servers **28** may be provided. Preferably, each transaction entry device **12** has an associated database server **28** for performing any desired processing of its data transactions, although it is preferred that the data transactions be copied to at least one other database server **28** as shown in FIG. **1**. This redundancy minimizes the possibility of losing data in the event of a power outage and the like. Preferably, each database server **28** contains essentially the same hardware, although modem **32**, transaction queue **34**, and transaction controller **36** have not been shown for all database servers **28** for ease of illustration.

In transaction entry mode, the data transaction assembler **18** of transaction entry device **12** creates a data transaction that is transmitted to an associated transaction controller **36** of an associated database server **28**. By "associated" it is meant that the database server **28** functions to perform any processing requested or necessary in conjunction with the storage of a data transaction from a particular transaction entry device **12**. Of course, a particular database server **28** may have several transaction entry devices **12** associated with it. So that no data will be lost, a particular database server **28** may also serve as a backup for another database server **28** in the event of the failure of any database server **28**.

As will be explained in more detail below with respect to FIGS. **2–4**, database server **28** "explodes" data transactions received from data transaction assembler **18** and provides the component parts of the "exploded" file dependent data transactions via modem **32** to other database servers **28** as necessary to update other databases. Alternatively, as shown by dotted line in FIG. **1**, the "explosion" of the data transactions may be performed by the data transaction assembler **18** at the transaction entry device **12** and the component parts transmitted to all appropriate databases **28** for updating the data therein. For this purpose, the data

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transaction assembler **18** will also need to know the modem numbers for all database servers **28** to be updated by the exploded data transactions. However, those skilled in the art will appreciate that this latter alternative will require access to numerous phone lines by the transaction entry device and that such phone lines are not always available to the user.

Finally, the third tier of the system **10** includes additional database servers **38** and databases **40** which support file dependent data transactions for specific applications. This additional tier of database servers **38** and databases **40** permits the data in the data transactions to be routed to application specific databases for storage of application specific data and access by those transaction entry devices **12** requesting data related to that specific application.

The creation and storage of a data transaction in accordance with the invention will now be described with respect to FIGS. **2–4**.

Data transactions are created by data transaction assembler **18** as a data stream of a known format. A generic data transaction is illustrated in FIG. **2**. As defined herein, a data transaction is created using a form containing one or more of the following: instructions, prompts, menu selection options, and a template with fields for data entry. Generally, the menu form consists of prompts for selecting a form, another menu, or a process, and a single slot for entering a selection, while the data entry form consists of prompts and instructions together with fields for entering data as shown in FIG. **2**. The data entry form can have either single or multiple fields for entering data.

In transaction entry mode, the user navigates through menus of data transaction assembler **18** until a form related to a particular type of data entry operation is selected. Once selected, data transaction form **42** is presented to the user on display device **20**. The data transaction form **42** is a collection of data defining the visual presentation on the display device **20** and a list of the fields through which linkages to external database files are defined.

As shown in FIG. **2**, data transaction form **42** includes a format field **44** which identifies the type of data transaction this form pertains to, the length of the form, the number of pages in the form, the number of bytes in each field, storage keys, and the like. The body of the data transaction form **42** comprises a predetermined series of prompts **46** which are provided to the display screen **20** as a data stream. The prompts preferably include descriptive data which may be alphanumeric, an icon, or a list that scrolls, if necessary. Fields **48** are blank spaces of predetermined size provided for accepting user input in response to each prompt. Generally, the size of each field **48** is also stored in the stream of data defining the data transaction form **42**. Since the prompts are tailored to elicit the necessary data for the application for which the data transaction form **42** was created, the fields **48** will include the user data necessary for processing a data transaction for that particular type of application. The user responses become part of the data stream which forms the data transaction. Typically, the data transaction form **42** also includes a miscellaneous processing field **50** which permits processing data unique to that form to be appended to the data transaction for transmission. Such processing data may include, for example, equations which define the relationships of the data in certain fields of the data transaction or audio or video data attached to a multimedia data transaction. In addition, non-display data associated with the time of data entry, the date of data entry, the user ID, and the like may be stored in miscellaneous processing field **50**.

FIGS. **3** and **4** illustrate the "explosion" of the stream of data forming the data transaction created using the data transaction form **42** of FIG. **2**. As shown in FIG. **3**, each data transaction contains data which is specific to a particular database and/or specific to particular files in one or more databases. The data in the data transaction is "exploded" accordingly. For example, the complete data transaction from FIG. **2** (Form A) is stored in a particular file (file **110**) of the database associated with the transaction entry device **12** which created the data transaction (database **11** in FIG. **1**). Storage of the entire data transaction is desired so that records may be maintained in the event of system error, power failure, and the like. The transaction controller **36** then extracts data from those fields of the data transaction which it knows to be related in forms of that particular type. For example, the data in fields **1, 2, 6, 10**, and a function of the data in field **11** may relate to a particular application stored in file **111** of database **11**. Similarly, the data in fields **3, 6, 10, 12**, and **14** may be related to an application stored in file **112** of database **11**, while the data in fields **1, 2, 7, 8, 9**, and a function of the data in fields **10, 11**, and **12** may be related to an application stored in file **113** of database **11**. These fields are extracted from the received data transaction by transaction controller **36**, reconstituted into a file entry of the appropriate format (as necessary), and stored in the associated database **30**.

All of the data in the received data transaction, or a subset thereof, may also be retransmitted to one or more additional application specific databases, such as database **21** of the databases **40** in tier **3**. As illustrated in FIG. **3**, the database specific data of fields **1, 4, 5, 13**, and **14**, forming the subset (Form B) of the original transaction (Form A), is stored in file **210** of database **21** so that a complete record may be maintained. Subsets of the data in Form B are then stored in specific files of database **21** as indicated. In this manner, the data of the original data transaction (Form A) is automatically sent to all databases which contain files which must be updated by any or all of the data in Form A.

FIG. **4** illustrates the explosion of the data transaction in FIG. **3** for the system **10** illustrated in FIG. **1**. As shown, the data in the data transaction (Form A) is extracted to update files **110–113** of database **11** as well as files **210–212** of database **21**. A redundant copy of Form A is also maintained in database **12**.

As will be explained more fully below, the system of FIGS. **1–4** is significant in that the data in a data transaction may update one or more databases serviced by file servers operating under control of numerous types of operating systems without the requirement of a terminal or operating system emulation by the transaction entry device **12**. On the contrary, the transaction entry device **12** of the invention permits data capture and storage with a minimum amount of processing at the transaction entry point (tier **1**), which, of course, minimizes system cost.

B. Transaction Entry Device 12 (FIGS. 5–10)

As noted above, the transaction entry device **12** is particularly characterized by the data transaction assembler **18**, which controls the various operations of the transaction entry device **12** in its transaction entry mode. Preferably, data transaction assembler **18** uses simple menu structures and predetermined forms stored as data streams in a flash memory for facilitating data entry. The menus are treated as a special type of form and are used to call other menus, forms, or processes. The forms, on the other hand, are used to create data transactions which are sent to one or more file

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servers operating under different operating systems, where the data transaction is "exploded" into its component parts for storage in a unique file structure for updating all records affected by the data in that data transaction. In turn, the "exploded" data transactions may be transmitted to another application specific database (tier 3) for storage. Processes, on the other hand, are selected to perform limited processing of the values in the fields of the forms. Such processing may be performed locally but is preferably performed by the associated database server **28**.

1. Hardware

A preferred embodiment of a transaction entry device **12** incorporated into a conventional telephone is illustrated in FIGS. **5** and **6**. As shown in FIG. **5***a*, a preferred desktop embodiment of a transaction entry device **12** includes a housing **52** on the order of 8 inches wide by 12 inches long for housing telephone electronics **14** and the hardware of data transaction assembler **18**. Transaction entry device **12** includes an optional handset (or headset) **54**, cradle **56** (FIG. **5***b*), numeric keypad **58**, telephone function/line keys **60**, microphone **62**, and speaker **16**, which facilitate operation of the transaction entry device in the telephone mode. As known to those skilled in the art, telephone functions accessed by telephone function keys **60** may include mute, speaker, line select, conference, hold, transfer, volume control, and the like.

However, the transaction entry device **12** is further characterized by display **20** with touch screen **64**, mode switch/computer function keys **66**, optional retractable keyboard **68**, and optional magnetic/smart card reader **70**, which facilitate operation of the transaction entry device **12** in the transaction entry mode. A memory card reader may also be accessed via a door (not shown) as in a laptop computer. Preferably, display **20** is a super twisted, high contrast, reflective liquid crystal display (LCD) with a minimum of 20 characters per line and 16 lines (preferably, 40 columns by 24 lines), while touch screen **64** is preferably a clear pressure sensitive keyboard made up of 224 keys (16 rows of 14 keys) attached to the face of the LCD. Preferably, the LCD is also available as a backlit unit. Of course, touch screen **64** is not necessary if optional keyboard **68** is provided. In addition, a battery backup **71** (FIG. **6**) may also be provided, alternatively, the battery **71** may be the primary power source for a portable (cellular) embodiment of the transaction entry device **12** in accordance with the invention.

FIG. **5***b* illustrates several of the connections to transaction entry device **12**. Typically, transaction entry device **12** includes a handset (headset) jack **72** for connecting optional handset (headset) **54** to telephone electronics **14** when it is desired to communicate more privately than when only microphone **62** and speaker **16** are used. A video input port **74** is also provided for connecting conventional data compression circuitry **75** within the transaction entry device **12** (FIG. **6**) to an optional video camera which provides picture phone type video or to a facsimile device or scanner. Such video data may be appended a frame at a time to the end of a data transaction in miscellaneous processing field **50** to create a multimedia data transaction as described above with respect to FIG. **2**. A video output port **76** is also provided for providing decompressed video or facsimile data from data decompression circuit **77** (FIG. **6**) to a video receiver, a high quality computer monitor, a facsimile device, and the like. Such data may also be provided to printer port **82** or **84** as desired. A multi-line phone jack (modem interface) **78** is also provided. Preferably, modem interface **78** provides separate modem connections for the telephone electronics **14** and the data transaction assembler **18**, although only a single modem connection is necessary.

An optional infrared transceiver **80** is further provided for enabling remote control operation of television and stereo equipment and the like in response to data transactions transmitted/received by the transaction entry device **12**. Infrared transceiver **80** includes an internal signal generator chip which reads parameters stored in data transaction assembler **18** for determining the appropriate transmission frequencies for the infrared signals. Control of the infrared devices is then provided through menus on the display **20**. Additional infrared transceivers **80** may also be provided on each corner of the housing **52** so that the infrared signal will cover more area (each transmitter typically covers about 60° circumference). All such devices are known to those skilled in the art and thus will not be described in detail here.

A computer interface (RS-232) serial port **82** and parallel port **84** is also provided for transmitting/receiving data to/from another computer device and for providing output to a printer. A power input port **86** and a keyboard input **88** are also provided. Keyboard input **88** accepts a connection from a standard keyboard or a folding type keyboard (not shown) which may be used in addition to, or in place of, retractable keyboard **68**. An optional removable PCMCIA memory card interface **89** (FIG. **6**) for updating the operating instructions of the data transaction assembler **18** and an optional RF transceiver **90** (FIG. **6**) for wireless networking to other electronic equipment may also be provided on the transaction entry device 12 as desired.

FIG. **6** is a schematic diagram of the electronics of the transaction entry device illustrated in FIGS. **5**(*a*) and **5**(*b*). Corresponding reference numerals for corresponding elements are used in FIGS. **5**(*a*), **5**(*b*) and **6**. As shown in FIG. **6**, in addition to the elements described above with respect to FIGS. **5**(*a*) and **5**(*b*), the transaction entry device **12** may include a simple voice recognition circuit **91** which permits voice selection of menu options and the like. In "voice selection" mode, the user would voice "1", "2" or "3" depending on the desired menu selection, and the voice would be picked up by microphone **62** on the housing **52** of the transaction entry device **12** and recognized by voice recognition circuitry **91**. The proper selection signal would then be sent to the data transaction assembler **18**. Similarly, the data transaction assembler **18** may provide audible output using a conventional voice synthesizer **92**, which provides the audio output to the user via speaker **16** and to a caller via modem interface/telephone line connection **78**. The voice synthesizer **92** may, for example, allow certain data transactions to be audibilized for a blind person who cannot make selections from a conventional video display. In addition, a voice recorder **93** may also be provided to record portions of telephone calls, portions of voiced data transactions, or a caller's message as when using a conventional digital answering machine. On the other hand, voice recorder **93** may be provided in database server **28** for use in storing/forwarding audible messages to the database **30**.

As noted above, the transaction entry device **12** is characterized by data transaction assembler **18**, which controls the creation of data transactions in the transaction entry mode. As shown in FIG. **6**, data transaction assembler **18** is implemented in hardware using a conventional microprocessor **94**, such as an Intel 80386SX (20 MHz or higher) or equivalent, a TAS PROM **95**, a form/menu memory **96**, and a transaction buffer (RAM) **97**. In a preferred embodiment, TAS PROM **95** is a flash PROM which holds 1 MB of control data (firmware) for the microprocessor **94** (such as the microcode for the algorithms of FIGS. 7–10 below),

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while form/menu memory **96** is a flash memory which holds 1 MB of data transaction menus and forms. Transaction buffer **97**, on the other hand, only needs to be as large as the largest data transaction, and may hold, for example, up to 128 kB of transaction data including application and operating system variables. Preferably, TAS PROM **95** and form/menu memory **96** are updated by downloading data streams containing new instructions and/or forms and menus over a conventional data bus **98** via modem **78**, magnetic card interface **70**, or via a removable memory card read by memory card interface **89** as necessary. Alternatively, additional flash memory elements may be added as additional applications are added to transaction entry device **12**. Transaction buffer **97** may also be expanded to handle transactions of any size or type, including multimedia applications in which video and/or audio data is appended to data transactions.

Those skilled in the art will appreciate that the transaction entry device **12** may be docked into a docking station of a network. RF transceiver **90** may be used for wireless communications in such an environment. In addition, those skilled in the art will appreciate that the transaction entry device **12** may be implemented as a battery operated portable device which is a cross between a laptop computer and a cellular telephone of the type illustrated by Paajanen et al. in U.S. Pat. No. 5,189,632, for example. In such an embodiment, an optional headpiece could be provided, as well as a microphone and speaker arrangement in the fliptop. Of course, the liquid crystal display screen would typically be reduced in size to, for example, 40 columns by 12 rows, and the touch screen **64** may be eliminated. However, most of the other options of the embodiment of FIGS. *5a* and *5b* would preferably remain so that the portable unit could also be used at a desk as desired. The electronics of the transaction entry device **12** would otherwise be as illustrated in FIG. **6** except for certain size and shape considerations well within the skill of those skilled in the art.

2. Software

As will be apparent from the following description, data transaction assembler **18** does not utilize a conventional operating system to control the operation of microprocessor **94**. On the contrary, TAS PROM **95** stores simple firmware algorithms (FIGS. **7–10**) operating in a kernel fashion for navigating a user through menus and forms provided from form/menu memory **96** for particular applications, and it is the resulting data streams which control the microprocessor **94** at any point in time. In other words, the data streams from the TAS PROM **95** and the data streams from the form/menu memory **96** together reconfigure microprocessor **94** into a special purpose processor for each application specified by the forms. The microcode of the TAS PROM **95** and the parameter streams from the form/menu memory **96** thus operate together as a simple form driven operating system for microprocessor **94** for all applications and is the sole code used to control microprocessor **94** (i.e., no conventional operating system or application programs are provided). As a result, the microprocessor **94** may be reconfigured into a new special purpose computer with each new form read from form/menu memory **96**, and such forms/menus may be added at any time by reading in the appropriate data streams from a memory card or from an external database server **28** or by adding an additional PROM. A specific implementation of the TAS firmware stored in TAS PROM **95** will be described below with respect to FIGS. **7–10**.

Thus, the TAS PROM **95** contains control data (firmware) for the microprocessor **94** and resides in each transaction entry device **12** for generating a template for a data transaction from a data stream stored in form/menu memory **96** (or received directly from a memory card or external database server) and from data input by a user or retrieved from an external database or magnetic card, smart card, and the like. The TAS firmware and the selected template together control the behavior of the microprocessor **94** by logically defining a table of menu options and/or database interfaces which are navigated through by the user. As noted above, the user navigates through a series of menu selections by selecting another menu, a form, or a process. Once the data transaction for a desired application is completed, it is transmitted out for "explosion" into all of its component parts for storage. In this form, the TAS firmware from TAS PROM **95** and menus and forms from form/menu memory **96** of the invention together replace a conventional operating system and individual application programs. Indeed, the invention permits the transaction entry device **12** to be completely operating system independent.

The data transaction assembler **18** of the invention is connected via a predetermined protocol stored as instructions within TAS PROM **95** to a database server **28** and its associated database **30**. As noted above, the database server **28** associated with a particular transaction entry device **12** operates as a repository of the data transactions created by the transaction entry device **12** and as a supplier of data to the transaction entry device **12** for completing the forms and providing additional forms, menus, processes, and the like. Since the system of the invention is operating system independent, there are no hardware or software limitations on the characteristics of the database server **28**.

The parameter set making up the individual forms are typically provided by database server **28** as a stream of data via modem and stored in form/menu memory **96**, while any downloaded instructions are stored in TAS PROM **95**. Linkage between data transaction assembler **18** and its database server **28** is preferably provided via a dictionary program specific to each database server **28**. This dictionary program knows the characteristics of each field of each form for each data transaction and is used by the database server **28** to "explode" the received data transactions into their component parts.

Preferably, at power on, data transaction assembler **18** automatically prompts the user with a "Download Parameter Streams" command so that the user can load into form/menu memory (flash memory) **96** from an external source the desired streams of menu and form data for the desired application. The "download parameter" process will then be initiated by dialing the external database server **28** initiating the connection via the modem interface **78**. Once connected, the transaction controller **36** of database server **28** will transmit the requested parameter stream. The data transaction assembler **18** will load the received data stream into form/menu memory **96**, and, upon completion, the prompt "Executive Menu Ready" will be presented on the display screen **20**. The executive menu then will be automatically presented to the user for selection of the desired menu, form, or process.

Upon initiation of the transaction entry mode by the user, data transaction assembler **18** calls a set of panel parameters from form/menu memory **96** and paints a form onto display screen **20**. These forms are either menus for navigating to particular forms or a form into which data is entered by the user. As will be explained below, the menus provide functionality through simple menu selection. The form on the display screen **20** is completed by the user by entering the appropriate data using touch screen **64** or optional keyboard

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68. Alternatively, the requested data may be read in from a memory card via memory card interface 90, from a magnetic strip on a swipe card or smart card via magnetic card interface 70 or memory card interface 89, or voice input via voice recognition circuit 91. In addition, a request may be sent to the database server 28 associated with the transaction entry device 12 for data needed to populate certain fields in the present form. The type of data entry is requested from a subset of options presented to the user upon pressing a "?" key or a "Request for More Information" button. This request will give the user several options to choose from, such as data entry using keyboard 68, touch screen 64, swipe card via magnetic card interface 70, memory card via memory card interface 89, by voice annunciation of the number of the item in the menu via voice recognition circuit 91, or via modem from a database 30. Hence, the data transaction created by the data transaction assembler 18 may or may not make use of stored data for reducing the amount of data entry required of the user.

When a data entry option is selected, data transaction assembler 18 does one of the following: another set of parameters is called up and another form is painted, the correctness of the selection is verified and a set of options for selections is presented based on interactions with stored data, the completed data transaction is transferred via modem to database server 28 for storage in database 30, or data values are requested from database 30 for incorporation within the transaction buffer 97. In a preferred embodiment, selections from the menu are made by touching the appropriate place on the menu using touch screen 64, by voice annunciation of the number of the menu item via microphone 62 and voice recognition circuit 91; by using one of the computer function keys 66 to run a cursor up the menu, another key to run the cursor down the menu, and a third key to make a selection in a conventional manner; or by using keyboard 68 as a selection device. When the keyboard 68 is used, the keyboard keys may be used to control a cursor, with the "enter" key being used for making a selection; alternatively, the number of the item selected may be entered and the "enter" key pressed to make the selection. Once the selection is made, the appropriate form is extracted from form/menu memory 96 as a stream of data.

Alternatively, in addition to presenting a menu for selection or completing a form, the data transaction assembler 18 can also present a menu selection for initiating a process such as calculation of an interest rate using one or more fields in the form, the finding of a mean, the finding of a name, or searching for entries for a particular date. These processes may be stored in TAS PROM 95, form/menu memory 96, in an off-line server where they are initiated, or any other place where they may be loaded down to the operating portion of the transaction entry device 12. In a preferred embodiment, processes are generally initiated in the database server 28 by sending a data request to the database server 28, processing the data in the database server 28, and then returning the answer as a data stream or report back to the transaction entry device 12.

A process typically initiates a data string which calls a process on an external machine. For example, the transaction entry device 12 may be used to download and store control signals for infrared control of various devices using infrared transceiver 80 (FIGS. 5 and 6). The form of the control signals will depend upon the signal storage in an optional infrared chip, which can be loaded by the data transaction assembler 18 or by an off-line device via modem or through the air using RF transceiver 90 for direct digital transfer in wireless form. In addition, in the case where the transaction entry device 12 is used in a medical office, for example, the process may be used to transmit a prescription to a pharmacy or mail order house using prestored modem numbers or may enable the physician to call up a list of phone calls to make for the day or a list of the followup appointments for a particular date. In other words, the TAS firmware can also "explode" the data transaction into all of its ancillary parts for transmission to numerous records in one or more databases.

A preferred embodiment of the TAS firmware will now be described with respect to FIGS. 7–10.

As noted above, the transaction assembly (application) server (TAS) is a data stream stored in TAS PROM 95 which together with the forms from form/menu memory 96 create a simple form driven operating system which provides the necessary control data (firmware) to microprocessor 94 so that no conventional operating system is necessary. FIG. 7 is a flow diagram of a menu driven TAS in accordance with a preferred embodiment of the invention. As illustrated, the TAS firmware starts at step 100 and fetches an initial menu from form/menu memory 96 at step 102. The initial menu is prompted within a few seconds of booting the TAS firmware after the system logo. The initial menu typically presents the options of downloading a parameter stream from the database server 28 for enabling additional functions or printing an executive menu. If the executive menu is selected, the executive menu is retrieved from form/menu memory 96. The executive menu contains numerous application options to the user, namely, selection of a form, another menu, a process, or an automatic switch to telephone mode, one of which is selected at step 104. The data streams in form/menu memory 96 may be distinguished as to type (form, menu, or process) by appending a code such as "F" for form, "M" for menu, and "P" for process, and as to number by appending a form, menu, or process number at the beginning of the following data stream. These codes are recognized by the TAS firmware, and it acts accordingly.

If the option selected at step 104 is a form, the proper form (data stream for form F_{xx}) is fetched from form/menu memory 96 at step 106, a transaction buffer 97 equal in length to the size of the record associated with the form F_{xx} is formed in RAM, the form is stored in the transaction buffer 97, and a connection is made to the appropriate database server(s) 28. The data stream for the selected form will consist of prompts, print locations for the prompt, data entry points, print locations for the data entry start, data entry length, and a code as to the nature of the data entry. This code can be numeric, alphanumeric, a cross-reference to stored data or previously entered data, a formula for the creation internally to data transaction assembler 18 of the result from previously entered data, or an external request for data, help, or reformulated values. The data stream entered into the fields of the form will not only indicate the location for the printing of the prompt and the field for data entry, but also the size of the field and the storage, a start point within the transaction buffer for the stored element, and the type of data: alphanumeric, numeric (floating point or integer), date, and the like.

If it is determined at step 108 that the requested form is actually a menu (M_{xx}), a hidden set of codes pointing to the form F_{xx} that the selection will lead to is read, and control branches back to step 104 for selection of another menu or form. When a menu is chosen, each item has its sequential number, its descriptor, and a code for what it will "call" (another menu, form, or process). In other words, each choice has associated with it a series of item codes which branch out to another form, menu, or series of tests upon the

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data entered. A menu also has a numeric code for each of the storage areas and a special code including a security code for certain menu items, process codes of forms within the menu, or a pointer to the process code. A pointer may also be provided in the menu for processes to be performed off-line (i.e., in an associated database server **28**).

If a process (P_{xy}) is selected at step **104**, the database server **28** is notified that something is requested from its database **30** or that some processing of data is requested. For example, the data transaction assembler **18** may send a user "?" inquiry to the database server **28** so that options may be returned to the data transaction assembler **18** for presentation to the user for selection. The process triggers an external process of database server with a parameter stream, and control is either returned to the data transaction assembler **18** or control is held up until the process is complete, in which case a message is sent back to the data transaction assembler **18**. This message can be a report, selected data, a value resulting from a calculation, and the like. Processing such as checking detectors and the like may also be performed locally by data transaction assembler **18**.

Once the desired form is selected for the user's application, the form is processed at step **110** in accordance with the steps outlined in FIGS. **8**–**10**. As an entry is made in each field, it is automatically stored within the input buffer area of the transaction buffer **97** at its assigned location and in the dictated format. At any time, the entire form may be exited with automatic return to the menu which called it or the form can be cleared for data reentry. Once the form has been processed and transmitted to the appropriate database server(s) **28**, the database server connection is terminated and the user is presented at step **112** with the last menu from which the user made his or her selection. Alternatively, the executive menu will be called up as a default menu.

If the user indicates at step **114** that he or she wishes to continue to complete a new form, control branches back to step **104** for menu selection and a new database server connection is made as appropriate. This process is repeated for each form. When no further selections are desired, the TAS firmware is exited at step **116**.

FIG. **8** is a flow diagram illustrating a technique for processing a form (step **110**) to create a data transaction in accordance with the invention. As illustrated, the process of FIG. **8** starts at step **118** and initializes a transaction buffer **97** at step **120** for storage of the data transaction as it is being created. In other words, if there is a form for the requested application, it is moved from form/menu memory **96** to the transaction buffer **97**. If the requested form is not present in form/menu memory **96**, an error message may be sent or a request may be sent to database server **28** for a download of a data stream containing the parameters for the requested form. Preferably, transaction buffer **97** is at least as large as the largest data transaction and serves as an assembly area for the data transaction. Preferably, read and write buffers are formed so that transmit and receive buffers to/from modem interface **78** are available. Of course, transaction buffer **97** may be made larger for this purpose.

Once the transaction buffer **97** is initialized at step **120**, the display screen **20** is cleared and the selected form is initialized to its first page at step **122**. The first page is then presented to the display screen **20** at step **124**. At step **126**, the user completes the form page on a field by field basis using any of the data entry techniques described above and the field controls of FIGS. **9** and **10**.

The transaction buffer **97** collects the data associated with the form presented to the user on display screen **20** and contains appropriate locations for each separate data element. Upon completion of the data transaction, the contents of the transaction buffer **97** are transferred to the appropriate database server(s) **28** via modem or via wireless, preceded by a set of codes (field **44**, FIG. **2**) which identify the type of data transaction and followed by a string of process identifiers for the database server(s) **28** to use in its programs in creating additional transactions and in storing the data and all ancillary data transactions in the regular file format of the database **30** associated with the database server(s) **28**. As a result, the data transaction created in the transaction buffer **97** has a one-to-many relationship to the data stored in the database **30**.

If the user decides to abort the processing of a form at any time (step **128**), the form processing routine is exited at step **129**. Otherwise, it is determined at step **130** whether the user wishes to go back a page (for a multi-page form) to correct a data entry. If so, control returns to step **124** for presentation of the earlier page. If the user does not wish to examine or edit a previous page, it is determined at step **132** whether the current form has another page which has not been displayed for completion by the user. If the form has more pages, the routine moves to the next page at step **134**, and it is determined at step **136** whether the move to the next page was successful. If so, control returns to step **124** for presentation of the next page. Of course, the process of calling a subsequent page in a form or another form upon completion of a form can be dependent upon an automatic call of that page or form sequence or the ability to jump sequence (i.e., skip pages) depending upon a value in any one field that has been entered. In any event, if there are no more pages in the form or if the move to the next page was not successful, the end of the form is marked with a code and the transaction is saved at step **138** by sending the data transaction to the appropriate database server(s) **28** for storage in its associated database **30** and "explosion" for storage of data in other databases **40**. If it is determined at step **140** that the save was not successful because of a modem error and the like, control returns to step **122** and the process is repeated. If the data transaction was successfully saved, the form processing routine is exited at step **129** and the last menu used is presented (step **112**).

Optionally, stored procedures within any data transaction form (field **50**, FIG. **2**) are executed at the appropriate time within the flow of the form processing routine before it is exited.

However, these processes may be deferred and performed by the database server **28** if needed.

FIGS. **9**(*a*) and **9**(*b*) together illustrate a flow diagram of a technique for completing and editing the fields of a form (step **126** of FIG. **8**). The field completion routine starts at step **142** and first determines at step **144** whether an abort or a valid page move request is pending. If so, the field completion routine is exited at step **146**. However, if no abort or page move request is pending, the field data for the first field of the transaction buffer **97** is entered at step **148**. As noted above, this field data may be entered via keyboard **68** or touch screen **64**, swiped in via magnetic card interface **70**, read in from a memory card via memory card interface **89**, read in via modem interface **78** from database server **28**, or designated by voice entry. Pre-edit processing of the field data is then performed at step **150**. Such pre-edit processing may include, for example, setting default values, performing calculations, establishing links to data in other files, looking up and writing data to files already linked to the present form, spawning another form, performing special updates of the display screen **20**, hiding fields from view by the user,

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and the like. Such pre-edit processing may also be used to determine whether modifications or actions in the present field may invalidate an entry in another interrelated field. If so, appropriate measures are taken to update all affected fields or to prevent such problems by setting appropriate default values.

The field completion routine then checks for field errors at step **152** on the basis of the default values and the like set at step **150**. If there is no field error at step **152**, it is determined at step **154** whether the operator will be permitted to edit the field in the absence of a field error. If so, or if a field error was found at step **152**, the operator edits the field at step **156**. If the operator editing is bypassed, control proceeds directly to post-edit processing at step **158**, which performs essentially the same functions as pre-edit processing step **150** except that the data may be specially validated. The field is then checked yet again at step **160** for a field error. If a field error is found at step **160**, control returns to step **144** for processing the next field or exiting, as appropriate.

If no field error is found at step **160**, it is determined at step **162** whether the generic field validation routine of step **164** (FIG. **10**) is to be skipped. If so, control proceeds to step **166**, where the field is once again checked for a field error. However, if generic field validations are desired, control passes to the routine of step **164** (FIG. **10**). If no field error is found at step **166**, the field is saved to the transaction buffer **97** at step **168** and the updated field value is painted on the display screen **20** at step **170**. If the user then desires to check a previous field at step **172**, control passes to a previous field at step **174** and the field completion routine is repeated for the previous field. However, if no previous field is to be checked and if it is determined at step **176** that a further field is present, control passes to the next field at step **178** and the field completion routine is repeated for the next field. This process repeats until the last field is completed and the routine exits at step **180**. Control then returns to FIG. **8** for processing a different page of the form.

Each form may be processed in one or more modes. In the input mode, described above, the data transaction is created and transmitted to the database server **28**. However, in edit mode, upon entering the ID of a particular record, that record is read from an external database **30** or **40** into transaction buffer **97** for editing. Preferably, a record of the edits is maintained to provide an audit trail. In view mode, upon entering the ID of a particular record, that record is similarly read from an external database **30** or **40** into transaction buffer **97** but for display only. Finally, in delete mode, an entire record can be deleted from the database **30** or **40** if the user has proper security clearance.

FIG. **10** illustrates how the TAS firmware validates the fields of each data transaction. As shown, the field validation routine starts at step **182** and first determines at step **184** what field type is present. If the present field is an alphanumeric field, control passes to step **186** where the field defaults are processed. It is then determined at step **188** whether the user knows the values allowed for this field. If not, and data is to be implanted in that field, an implant table is searched at step **190**. A "?" may be used by the operator to indicated that he or she does not know the values allowed for this field and wishes to search the implant table. A list of possible values are then called up that match the data entered thus far. From this list, the operator can scroll the list and select the value that will complete the data entry. However, if the value is not found in the list, a field error is generated at step **192** and the field validation routine is exited at step **194**. If the value is found in the list, control passes to step **200**.

On the other hand, if at step **188** it is determined that data need not be added (implanted) into the present field, control skips to step **196**, where it is determined whether the present field type is a field which sets up an event in which the present field (along with its form) can be linked to any record of any file or files (one to many) of any database for the purpose of data verification and/or data extraction. If so, control passes to step **198**, where the data from the present field along with any other data previously gathered is used to make the desired link. As in the data implant step **188** noted above, the user may enter a "?" to get the information needed to make this link. If the data for the link is not found, a field error is issued at step **192** and the field validation routine is exited at step **194**. However, if the data for the link is found, the field is checked for blanks at step **200** and a field error is issued at step **192** if blanks are present in the field but are not allowed. If no blanks are found in the present field, or if blanks are found but are allowed, the field validation routine is exited at step **202**.

If it is determined at step **184** that the present field is a numeric field, the field is checked at step **204** to determine if the character set is valid. If so, the precision of the numbers is adjusted at step **206**, as necessary, and the range and scope of the numbers are checked at step **208** to make sure the field entries satisfy the boundary conditions (e.g., no dividing by zero). If the character set is not valid at step **204** or the range and scope of the numerals is not valid at step **208**, a field error is issued at step **210** and the data validation routine is exited at step **212**. Otherwise, the field validation routine is exited at step **214**.

If it is determined at step **184** that the present field is a date/time field, the field is checked at step **216** to determine if the character set is valid. If not, a field error is issued at step **210** and the field validation routine is exited at step **212**. Otherwise, a routine of the TAS firmware checks the date/time entry at step **218** to determine if it has the correct format by performing range checking and the like. If the date/time entry does not have the correct format, a field error is issued at step **210** and the field validation routine is exited at step **212**. Otherwise, it is determined at step **220** whether the present field contains a date. If not, the data validation routine is exited at step **221**. If so, the date is checked at step **222** so see if it contains a weekend, and, if so, checks at step **224** whether a weekend date is an acceptable reply for this field. It is then determined at step **226** whether the calendar file is to be checked, and if so, the calendar file is checked at step **228** to see if the date is valid (e.g., not a February 30 and the like). Finally, it is determined at step **230** whether a warning date has been exceeded, and if so, a field error is issued at step **210** before the field validation routine is exited at step **212**. Otherwise, the field validation routine is exited at step **221**.

Those skilled in the art will appreciate that, in order to maintain security, the TAS firmware may also present a security form for password entry to the user. The security form and ID of the transaction entry device **12** is then encrypted and transmitted to the database server **28** associated with the particular data transaction assembler **18**. Transaction controller **36** of that database server **28** will then act as the transaction controller for that data transaction assembler **18** and will check passwords and the like during operation to make certain that data security is not breached. Database servers **28** may disable a data transaction assembler **18** if unauthorized use is attempted. In this manner, only the appropriate person may view each menu. Of course, a different number of security levels and different executive menus may be presented as desired, all under control of the transaction controller **36**.

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C. Database Server 28

As noted above, the database server 28 acts as a vehicle for separating data transactions created by the data transaction assembler 18 into the component parts thereof which may be stored directly in one or more databases 30 and 40. In other words, the database server 28 explodes the initial data transactinn into data transactions for many different files for updating records in the files, and the like. Also, the database server 28 may be virtual as well as real, exist in a single machine or in multiple machines, in whole or in part.

Generally, the database server 28 handles any and all data transactions received, manipulates data in the data transactions, spawns or starts processes or reports requested by a data transaction, and explodes the received data transactions into all sorts of data transactions that were spawned by the initial data transaction. Database server 28 can also update values in existing records and can switch to a process for processing values in the records as necessary. In this manner, a single data transaction can define actions causing multiple files to be updated. Database server 30 also handles requests from the data transaction assembler 18 and processes them as needed. Such requests may include data I/O requests, data locking and unlocking, report processes, and requests for new forms or menus. Those skilled in the art will appreciate that database server 28 maintains the one-to-many relationships that exist between the user and the system of the invention, the one-to-many presentations to the user and files in the databases 30 and 40, and the one-to-many data transactions and the ancillary records, updates, and postings as may be required to diverse computer files of numerous databases 40, the transaction entry device 12 and the database servers 28.

As noted above, transaction buffer 97 collects the transaction data associated with the form presented to the user via display screen 20. The transaction buffer 97 is the image of the data transaction with appropriate locations for each separate data element. The contents of the transaction buffer 97 are transferred to the database server 28 via modem interface 78 or via RF transceiver 90, preceded by a set of codes 44 (FIG. 2) which identify the type of transaction followed by a string of process identifiers for the database server 28 to use in its programs, in creating additional data transactions, and in storing the data and all ancillary transactions within the database 30 in the regular file format of the database 30. In other words, the database server 28 determines what type of action to take based on the type of data transaction received, "explodes" a data transaction into a plurality of other data transactions for transmission to other databases, as appropriate, and converts the data for its associated database 30 into the proper file format. Of course, each database server 28 is different from each other database server 28 since it will handle different types of data transactions, have different operating system characteristics, and different file conversions to make in accordance with the file formats of its associated database 30. For example, the database server 28 may operate under an operating system such as Unix, Windows, or DOS, where the operating system provides the database server 28 with links to the hardware functions normally handled by an operating system. Preferably, the database server 28 also operates with menus, forms, and the like in the same fashion as the data transaction assembler 18 except that it stores the data transactions in its associated database 30 as transaction files.

As just noted, the purpose of the database server 28 is to process the data transaction from the data transaction assembler 18 and to either explode the data transaction into all of its related components for storage, to handle the storage of items from the explosion process, to store the data transaction itself for reference purposes, and to act as a supplier of information to the data transaction assembler 18 in response to requests during the creation of the data transaction and during the downloading of parameters for menus and forms to the data transaction assembler 18. If desired, the database server 28 can also supply information back to the data transaction assembler 18 after a data transaction is received or can initiate a process leading to the delivery of a report, data, or menu to the data transaction assembler 18. In addition, the database server 28 and data transaction assembler 18 can reside on the same machine so long as the database server's operating system recognizes the TAS firmware or the TAS firmware is modified for use with the operating system of the database server 28.

D. Applications of the Invention

As outlined above, the present invention includes a point of transaction device which presents a menu to a user from which an option is selected. A form tailored to the selected option appears for guiding the user through data entry. The full details of the data transaction are captured as data is entered by the user. Modem interaction with a central database(s) or a user database(s) allows for interaction for help and verification of certain entered data. The completed transaction is then transmitted to the central or user database for further processing and storage. Data input can also be provided via a swipe card or smart card, from data received from any database accessible via the modem interface, or other known methods.

A data transaction system of this type may be used for many applications. For example, in a first, presently preferred, application, the transaction entry device 12 is located in a medical office for entry of patient data. In this application, a swipe card identifies the patient, a smart card identifies the doctor, and the modem connection allows the entire claim transaction to be entered and transmitted to the insurance companies for processing. The patient records may also be automatically updated and prescriptions created, given to the patient, transmitted to the pharmacist, and transmitted to the payor and patient record. Patient instructions such as special diets, exercises, treatments, appointments, and the like may be printed from the data transaction form at the doctor's central computer. In addition, a video image or picture provided via video input 74 and compressed by data compression circuitry 75 permits an image of a medical condition such as a rash to be appended to the data transaction (in miscellaneous processing field 50 of FIG. 2) for transmission with the patient's name, the date, a description of patient symptoms, and the like. Similarly, a recorded heartbeat may be appended to the end of the data transaction for transmission with the patient data.

The data transaction entry system of the invention also has numerous home uses. In a preferred home use, the transaction entry device is used for performing bank transactions from the home. In this case, forms would be made available by the bank for different types of bank transactions. These forms would then be downloaded to the transaction entry device in the customer's home and used in creating and transmitting data transactions to the bank computer for off-line processing.

As another example, the user may dial-up to a 900 number to get an interface to a central database which will download codes into TAS PROM 95 or form/menu memory 96 which

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enable the generation of infrared signals at certain frequencies. The user needs only to specify the type, make and model of any electronic device to be controlled in order to get the desired code. Then, to operate any electronic device in the home, the user would be directed by menu prompts. The transaction entry device **12** would then emit an infrared signal via infrared transceiver(s) **80** to operate the electronic device, initiate a call via modem for a broadcast program, or initiate timed requests for video recording, turning the video recorder on and off, and the like.

For other home uses, the transaction entry device **12** may also initiate, via menu prompts, sequences for turning on and off various household devices including alarm systems, coffeemakers, and the like. In this mode, the transaction entry device **12** may receive an RF or infrared signal indicating that a burglar or fire alarm has been activated and call up a form for calling the police or fire department, as appropriate. A call to the transaction entry device **12** may then be used to turn off the burglar or fire alarm by changing a field in a form which instructs the infrared transceiver **80** or RF transceiver **90** to send an appropriate control signal to the alarm device. This feature may also be prompted from a car phone via remote initiation of the form performing this function.

The transaction entry device **12** may also control all household telephone use as well as controlling the answering machine and keeping a telephone transaction log. The user may also pay household bills by completing an appropriate form and transmitting the form to a payee such as a credit card company, a bank, and the like. In short, the transaction entry device will permit the owner to connect to a remote database without owning a conventional computer system with an operating system and the like.

For personal applications, the transaction entry device **12** may be used to initiate a facsimile transmission, to provide telephone lists with automatic dialing upon selection, to provide expense accounts, personal scheduling, tax record keeping, and the like, and to provide direct access to travel information. For example, the database server **28** may be an airline reservations system. In this application, the data transaction assembler **18** dials the modem of the airline reservations system when the user requests data entry into an airline reservations form available at the user's transaction entry device **12**. The data transaction device **18** modems the database server **28**, and the operating system of the database server **28** selects interface programs for the airline reservations system. The interface programs call the database servers **38** of the airlines, retrieve the appropriate menu from database **40**, and modem the menu to the data transaction assembler **18**. The data transaction assembler **18** then displays the airline reservations menu on its display screen **20** for completion and transmission back to the airline reservations database server for processing. The swipe card may be used to provide credit card payment information and may be updated by permitting the data transaction assembler **18** to write to the swipe card. The user may also access frequent flyer club and mileage data, special offers on hotels, cruises and other travel, and the like.

In another home (or business) use, the transaction entry device **12** may be used to eliminate conventional phone mail greetings by enabling the caller's transaction entry device **12** to read in a set of visible menus from the called party's voice mail menu so that the calling party may select the desired options using a visible menu rather than a voiced menu. In other words, the caller would not have to wait through the litany of voiced phone mail options before making a selection and could make the desired selection right off of his or her own display. This would be accomplished by selecting a process from the menu of the transaction entry device **12** which will create a "visible" menu. When such a process is selected, the telephone electronics **14** or modem interface **78** makes a telephone connection to a remote phone mail system. Once the connection is made, the data transaction assembler **18** sends a data request for a visual representation of the phone mail menu of the remote phone mail system via the telephone connection to the remote phone mail system. A data stream containing the visual representation of the phone mail menu from the remote phone mail system is then returned via the telephone connection and stored in form/menu memory **96** and presented to display screen **20** of the transaction entry device **12** for selection using the techniques described herein. When menu items are selected from the "visible" voice mail menu, the data transaction assembler **18** creates a data transaction indicating which menu item was selected and sends the data transaction to the remote phone mail system via the telephone connection. Based on the menu selection, the remote phone mail system then returns a data stream containing a visual representation of the next phone mail menu via the telephone connection for storage in form/menu memory **96** and display on display screen **20**. This process is repeated until the calling party is required to leave a message or the called party is reached. Such a system would be particularly helpful for interacting with voice mail systems, such as those at government offices, where numerous options are presented for selection.

Those skilled in the art will appreciate that the invention is unique by virtue of its ability to generalize applications to forms so that no code need to be written to implement a particular function. However, if code is needed or if multimedia data is to be part of a data transaction, it can be attached to a form which is stored as a parameter stream in a stream of data. Also, though the transaction entry device **12** has been described as a computer workstation, it can also be used in conjunction with an optional off-line storage device as a self-contained workstation and database unit independent of traditional operating systems. The transaction entry device **12** can also be used with an additional optional plug in as a network server or as a user interface in a network docking station.

Those skilled in the art will also appreciate that the foregoing has set forth the presently preferred embodiments of the invention but that numerous alternative embodiments are possible without departing from the novel teachings and advantages of the invention. Accordingly, all such modifications are intended to be included within the scope of the appended claims.

We claim:

1. A system for entering transaction data into a remote database, comprising:

a data input device;

a display;

a data transaction terminal including a microprocessor, a form memory, and a form driven operating system which controls said microprocessor to present to said display at least one form stored in said form memory as data streams, said form eliciting data input of a desired transaction type into said data input device by a user, said at least one form including at least one prompt customized to said desired transaction type, said data transaction terminal further including means for formatting at least said data input by said user in response to said at least one prompt into a data transaction for transmission to said remote database; and

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a database server associated with said remote database which receives said data transaction, creates from said data transaction, depending on said desired transaction type, at least one additional data transaction containing data for a particular record in said remote database, and stores said at least one additional data transaction in said particular record.

2. A system as in claim 1, further comprising a plurality of remote databases, wherein said database server further creates from said data transaction, depending on said desired transaction type, at least one ancillary data transaction containing data for a particular record in one of said plurality of remote databases besides said remote database and stores said at least one ancillary data transaction in said particular record.

3. A system as in claim 2, wherein said form driven operating system includes means for sending a data request to said database server, said database server accessing data corresponding to said data request in at least one of said remote databases and returning one of data responsive to said data request, a list of options for selection by said user, a value calculated from data contained in said data request, and a data report.

4. A system as in claim 1, wherein said form driven operating system comprises a transaction assembly server (TAS) which presents said data streams to said microprocessor for display on said display, and said formatting means comprising a transaction buffer which stores said data input in to said data input device by said user in response to said at least one prompt until said data transaction is completed for transmission to said remote database.

5. A system as in claim 4, wherein said data transaction terminal further comprises a modem, a telephone and two telephone line connections, one for connecting said telephone to a telephone network, and one for providing a modem connection among said modem, said TAS, and said database server.

6. A system as in claim 5, wherein said data transaction terminal further comprises a mode switch for selecting a telephone mode in which said data transaction terminal operates exclusive of said TAS or a transaction entry mode in which said TAS operates exclusive of said telephone.

7. A system as in claim 4, wherein said data transaction terminal further comprises a modem, a telephone, a telephone line connection, and means for selectively connecting said telephone to a telephone network and said TAS to said database server via said telephone line connection.

8. A system as in claim 7, wherein said selectively connecting means comprises a mode switch for selecting a telephone mode in which said data transaction terminal operates exclusive of said TAS or a transaction entry mode in which said TAS operates exclusive of said telephone.

9. A system as in claim 1, wherein said database server comprises a modem, a data transaction queue for storing data transactions received from said data transaction terminal, and a transaction controller which processes the received data transactions to extract physical relationships of data of said data transactions with records in said remote database.

10. A system as in claim 1, wherein said form memory further stores a plurality of menus for presentation to said user, said user selecting options from one of said menus using said data input device for navigating to said at least one form.

11. A system as in claim 10, wherein said one menu provides said user with an option of selecting at least one of said at least one form, another menu, and a process for processing data in a data transaction.

12. A system as in claim 11, wherein said one menu further contains a remote process option, and when said user selects said remote process option from said one menu, data streams are downloaded via a modem to said form memory, said data streams containing control data for implementing functions designated by said selected remote process option.

13. A system as in claim 12, wherein said data transaction terminal further comprises an infrared transceiver and said control data comprises data for controlling a wavelength of energy emitted by said infrared transceiver.

14. A system as in claim 12, wherein said data transaction terminal further comprises a phone list memory for storing a phone list and said control data comprises data for updating said phone list.

15. A system for entering transaction data into a plurality of remote databases, comprising:

a data transaction terminal for capturing a data transaction having a one-to-many relationship to records of said plurality of remote databases, said data transaction terminal including a microprocessor, a form memory, and a form driven operating system which controls said microprocessor to present to a user at least one form stored in said form memory as data streams, said form eliciting data input of a desired transaction type into said data transaction terminal by said user, said at least one form including at least one prompt customized to said desired transaction type, said data transaction terminal further including means for formatting at least said data input by said user in response to said at least one prompt into said data transaction for transmission to at least one of said plurality of remote databases;

a first set of database servers associated with a first set of remote databases of said plurality of remote databases, said first set of database servers receiving said data transaction, creating from said data transaction a plurality of ancillary data transactions having a one-to-one relationship to said records of said plurality of remote databases, and storing said ancillary data transactions in designated records of said first set of remote databases; and

a second set of database servers associated with a second set of remote databases of said plurality of remote databases, said second set of database servers receiving certain of said plurality of ancillary data transactions, and creating from said certain ancillary data transactions additional data transactions which are stored in application specific records of said second set of remote databases in accordance with said desired transaction type of said at least one form.

16. A system as in claim 15, wherein each database server of said first and second set of database servers comprises a modem, a data transaction queue for storing data transactions, and a transaction controller which processes a received data transaction to extract physical relationships of data of said data transactions with records of a remote database associated with said each database server.

17. A system as in claim 15, wherein said data particular to said desired transaction type includes at least one of audio and video data.

18. A data transaction terminal for providing data transactions to a remote database server which stores records in an associated database, comprising:

a data input device;

a display;

a telephone circuit;

a data transaction assembler including a microprocessor, a form memory, and a form driven operating system

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which controls said microprocessor to present to a user at least one form stored in said form memory as data streams, said form eliciting data input of a desired transaction type into said data transaction assembler by said user, said at least one form including at least one prompt customized to said desired transaction type, and means for formatting at least said data input by said user in response to said at least one prompt into a data transaction for transmission to said remote database server, and

a mode switch for selectively connecting said telephone circuit to a telephone network in a telephone mode and said data transaction assembler to said remote database server in a data transaction entry mode.

19. A terminal as in claim **18**, wherein said form driven operating system comprises a transaction assembly server (TAS) which presents said data streams to said microprocessor for display on said display, and said formatting means comprising a transaction buffer which stores said data input into said data input device by said user in response to said at least one prompt until said data transaction is completed for transmission to said remote database.

20. A terminal as in claim **19**, wherein said TAS presents one of said menus to said user for selection, said one menu containing pointers to a plurality of forms, and upon selection of said at least one form from said menu by said user, said TAS initializes said transaction buffer and presents said at least one form to said display on a page by page basis for entry of said input data by s aid user.

21. A terminal as in claim **19**, wherein said form memory further stores a plurality of menus for presentation to said user, said user selecting options from one of said menus using said data input device for navigating to said at least one form.

22. A terminal as in claim **21**, wherein said one menu provides said user with an option of selecting at least one of said at least one form, another menu, and a process for processing data in a data transaction.

23. A terminal as in claim **22**, wherein said one menu further contains a remote process option, and when said user selects said remote process option from said one menu, data streams are downloaded via a modem to said form memory, said data streams containing control data for implementing functions designated by said selected remote process option.

24. A terminal as in claim **23**, further comprising an infrared transceiver, said control data comprising data for controlling a wavelength of energy emitted by said infrared transceiver.

25. A terminal as in claim **23**, further comprising a phone list memory for storing a phone list, said control data comprising data for updating said phone list.

26. A terminal as in claim **18**, further comprising a modem and two telephone line connections, one for connecting said telephone circuit to said telephone network, and one for providing a modem connection among said modem, said TAS, and said remote database server.

27. A terminal as in claim **18**, further comprising a modem and a telephone line connection, said mode switch selectively connecting said telephone and said TAS to said telephone line connection.

28. A terminal as in claim **18**, wherein said TAS processes said input data as it is entered in response to each prompt to determine if said input data satisfies predetermined conditions for input data entered in response to each said prompt.

29. A terminal as in claim **18**, wherein said TAS sends a data request to said remote database server when said user requests assistance in replying to a prompt and inserts reply data from said remote database server into said data transaction in response to said prompt.

30. A terminal as in claim **18**, wherein said TAS comprises means for creating from said data transaction, depending on said desired transaction type, at least one ancillary data transaction containing data for a particular record in said associated database and storing said at least one ancillary data transaction in said particular record in said associated database.

31. A terminal as in claim **30**, wherein said ancillary data transaction creating means further creates from said data transaction, depending on said desired transaction type, an ancillary data transaction containing data for an application specific record in a secondary database and sends said ancillary data transaction to said secondary database for storage of said ancillary data transaction in said application specific record.

32. A terminal as in claim **18**, wherein said data transaction assembler includes means for sending a data request to said remote database server, said remote database server accessing data corresponding to said request in said associated database and returning one of data responsive to said request, a list of options for selection by said user, a value calculated from data contained in said data request, and a data report.

33. A terminal as in claim **32**, wherein said remote database server is a remote phone mail system and said telephone circuit makes a telephone connection to said remote phone mail system, said data request being sent via said telephone connection and including a request for a visual representation of navigation options of a phone mail menu of said remote phone mail system, and, in response to said data request, said remote phone mail system returning via said telephone connection a data stream containing said visual representation of said navigation options of said phone mail menu, said visual representation of said navigation options of said phone mail menu being presented to said display by said data transaction assembler for selection by said user using said data input device, and said data transaction assembler further sending data to said remote phone mail system via said telephone connection indicating which navigation option was selected from said phone mail menu by said user.

34. A terminal as in claim **33**, wherein said remote phone mail system returns a data stream containing a visual representation of navigation options of a next phone mail menu via said telephone connection in response to said data indicating which navigation option was selected from said phone mail menu by said user.

35. A terminal as in claim **18**, wherein said data input device comprises at least one of a touch screen associated with said display, a telephone numeric keypad, an alphanumeric keyboard, a memory card reader, and a magnetic card reader.

36. A terminal as in claim **35**, wherein said alphanumeric keyboard comprises a retractable keyboard which retracts into a housing of said data transaction terminal.

37. A terminal as in claim **18**, further comprising a video input terminal for receiving input video data and a video output terminal for providing output video data to a video monitor.

38. A terminal as in claim **37**, further comprising a data compression circuit for compressing said input video data prior to including said input video data in a data transaction and a data decompression circuit for decompressing output video data prior to display on said video monitor.

39. A terminal as in claim **18**, further comprising a computer I/O port for receiving input data from a computer

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device and providing output data to at least one of said computer device and a printer.

40. A terminal as in claim 18, further comprising a RF transceiver for providing a wireless connection between said data transaction terminal and a data processing device.

41. A terminal as in claim 18, further comprising a battery for providing power to said data transaction terminal for portable operation.

42. A terminal as in claim 18, wherein said data input device comprises a voice recognition circuit for accepting data input selections annunciated by said user.

43. A terminal as in claim 18, further comprising a voice synthesizer responsive to said data transaction for audibilizing a portion of said data transaction to said user.

44. A terminal as in claim 43, further comprising a voice recorder for recording at least one of said audibilized portion of said data transaction when in said data transaction entry mode and voice input from a called party when in said telephone mode.

45. A method of entering transaction data into a remote database using a data transaction terminal, comprising the steps of:

loading from a remote database server at least one predetermined form including at least one prompt customized to a desired transaction type into a form memory of a form driven operating system of said data transaction terminal, said form driven operating system controlling a microprocessor of said data transaction terminal to accept input data of said desired transaction type from a user,

said form driven operating system presenting to a display said at least one predetermined form for eliciting data input of said desired transaction type from said user;

said user inputting data in response to said at least one prompt using a data input device;

formatting at least said input data from said user into a data transaction for transmission to said remote database, and

transmitting said data transaction to said remote database.

46. A method as in claim 45, comprising the additional steps of:

receiving said data transaction at said remote database;

creating from said data transaction, depending on said desired transaction type, at least one additional data transaction containing data for a particular record in said remote database; and

storing said at least one additional data transaction in said particular record.

47. A method as in claim 46, comprising the additional steps of:

creating from said data transaction, depending on said desired transaction type, at least one ancillary data transaction containing data for a particular record in an ancillary database different from said remote database, and

storing said at least one ancillary data transaction in said particular record in said ancillary database.

48. A method as in claim 45, comprising the additional steps of:

sending a data request to a database server of said remote database; and

said database server accessing data corresponding to said data request in said remote database and returning one of data responsive to said data request, a list of options for selection by said user, a value calculated from data contained in said data request, and a data report.

49. A method as in claim 45, comprising the additional steps of:

storing a plurality of menus for presentation to said user; and

said user selecting said at least one form from one of said menus using said data input device.

50. A terminal for displaying navigation options of a phone mail menu of a remote phone mail system on a local display, comprising:

a telephone circuit for making a telephone connection to said remote phone mail system;

control means for sending a request for a visual representation of said navigation options of said phone mail menu via said telephone connection, for receiving a data stream containing said visual representation of said navigation options of said phone mail menu from said remote phone mail system via said telephone connection, and for presenting said visual representation of said navigation options of said phone mail menu to said local display, and

selection means for selecting a navigation option from said navigation options of said phone mail menu displayed on said local display and for instructing said control means to send data to said remote phone mail system via said telephone connection indicating which navigation option was selected from said phone mail menu.

51. A terminal as in claim 50, wherein said remote phone mail system returns a data stream containing a visual representation of navigation options of a next phone mail menu via said telephone connection in response to said data indicating which navigation option was selected from said phone mail menu.

52. A method of displaying navigation options of a phone mail menu of a remote phone mail system on a local display, comprising the steps of:

establishing a telephone connection to said remote phone mail system;

sending a request for a visual representation of said navigation options of said phone mail menu via said telephone connection,

receiving a data stream containing said visual representation of said navigation options of said phone mail menu from said remote phone mail system via said telephone connection;

presenting said visual representation of said navigation options of said phone mail menu to said local display;

selecting a navigation option from said navigation options of said phone mail menu displayed on said local display; and

sending data to said remote phone mail system via said telephone connection indicating which navigation option was selected from said phone mail menu.

53. A method as in claim 52, wherein said remote phone mail system further returns a data stream containing a visual representation of navigation options of a next phone mail menu via said telephone connection in response to said data indicating which navigation option was selected from said phone mail menu.

* * * * *

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,987,103

DATED : November 16, 1999

INVENTOR(S) : Rocco L. Martino

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Col. 4, line 19, "ssociated" should be --associated--;

Col. 4, line 54, "hich" should be --which--;

Col. 27, line 52, "furt her" should be --further--.

Signed and Sealed this

Eighteenth Day of July, 2000

Attest:

Attesting Officer

Q. TODD DICKINSON

Director of Patents and Trademarks

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APPENDIX E

A copy of U.S. Patent No. 6,601,237 to Ten Kate.

US006601237B1

(12) **United States Patent**
Ten Kate et al.

(10) **Patent No.: US 6,601,237 B1**
(45) **Date of Patent: Jul. 29, 2003**

(54) **APPARATUS AND METHOD FOR RESCHEDULING PROGRAM CONFLICTS IN A VIRTUAL CHANNEL SCHEDULING GAP**

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(73) Assignee: **Koninklijke Philips Electronics N.V.**, Eindhoven (NL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/469,876**

(22) Filed: **Dec. 22, 1999**

(30) **Foreign Application Priority Data**

Dec. 23, 1998 (EP) 98204425

(51) **Int. Cl.**[7] **G06F 3/00**

(52) **U.S. Cl.** **725/47**; 725/46, 725/49, 725/52; 725/54, 725/58; 386/83

(58) **Field of Search** 725/46, 47, 49, 725/52, 54, 58; 386/83

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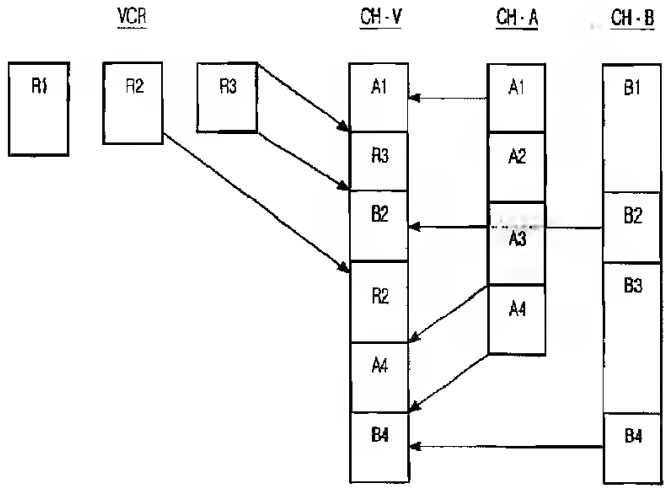
(74) *Attorney, Agent, or Firm*—Laurie E. Gathman

(57) **ABSTRACT**

The invention relates to an apparatus for receiving programs from a plurality of channels, comprising a tuner for tuning to any of the plurality of channels, and an electronic program guide (EPG) for presenting a schedule of the programs. The apparatus comprises virtual channel means for creating a user selectable virtual channel for reproducing selected programs from various genuine channels. The virtual channel means are adapted to control the tuner to tune to a channel currently broadcasting a selected program. When a user selects the virtual channel, the apparatus takes care of automatically switching between the genuine channels broadcasting the programs viewed on the virtual channel. As a consequence, the user can view the desired programs by simply selecting the virtual channel.

20 Claims, 3 Drawing Sheets



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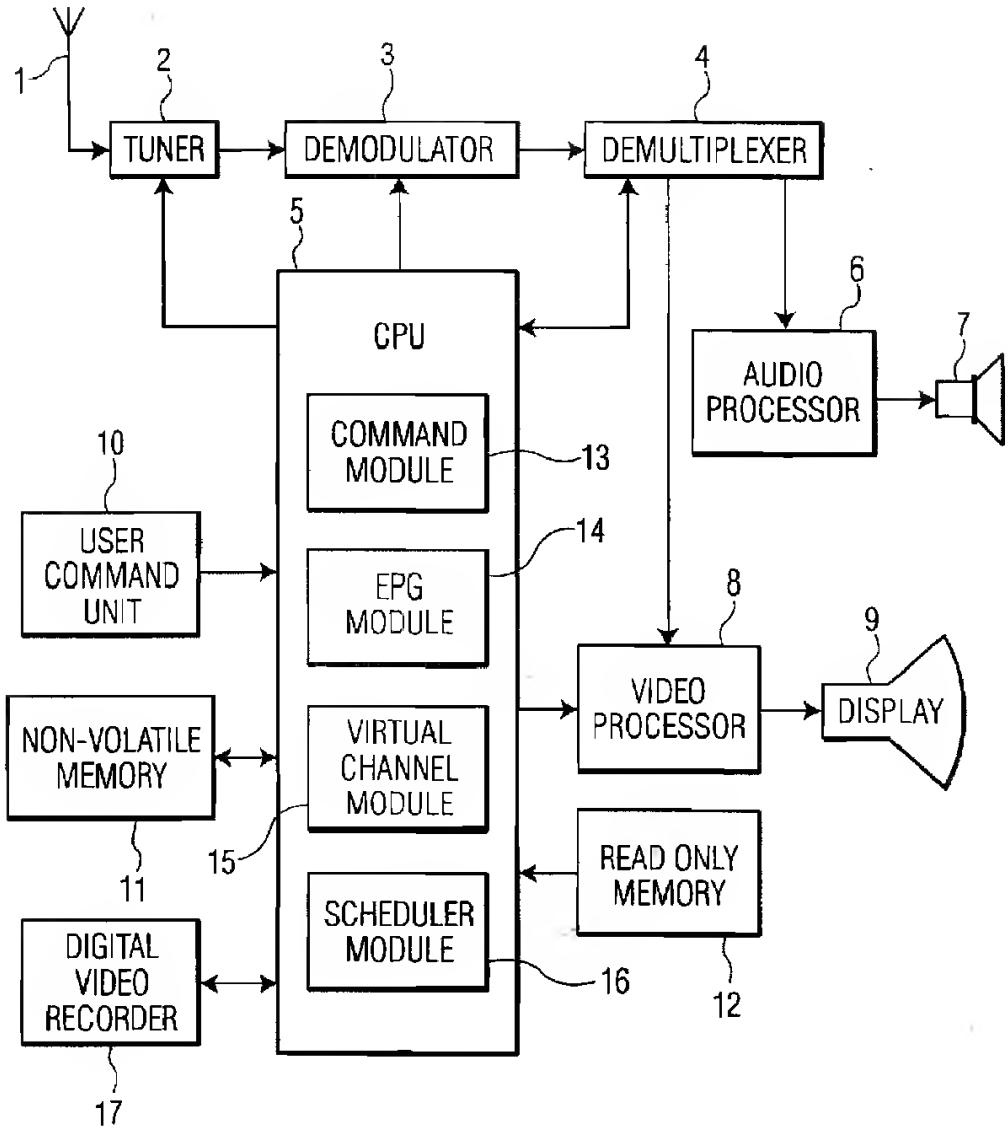

FIG. 1

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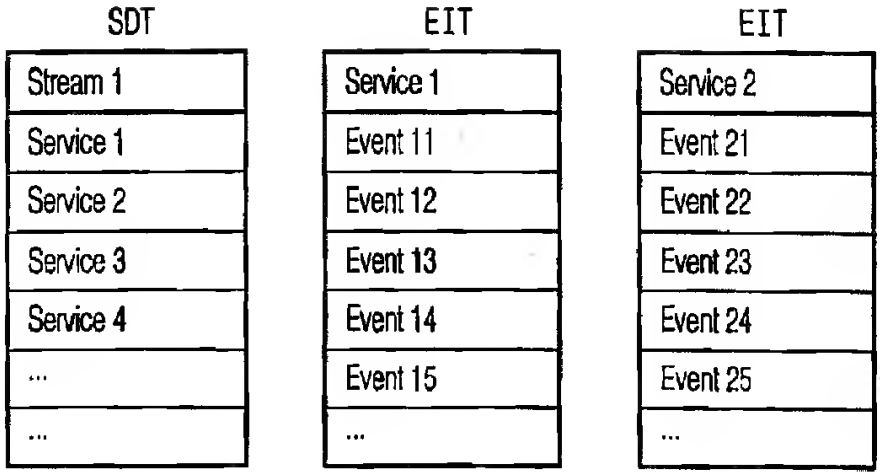

FIG. 2A

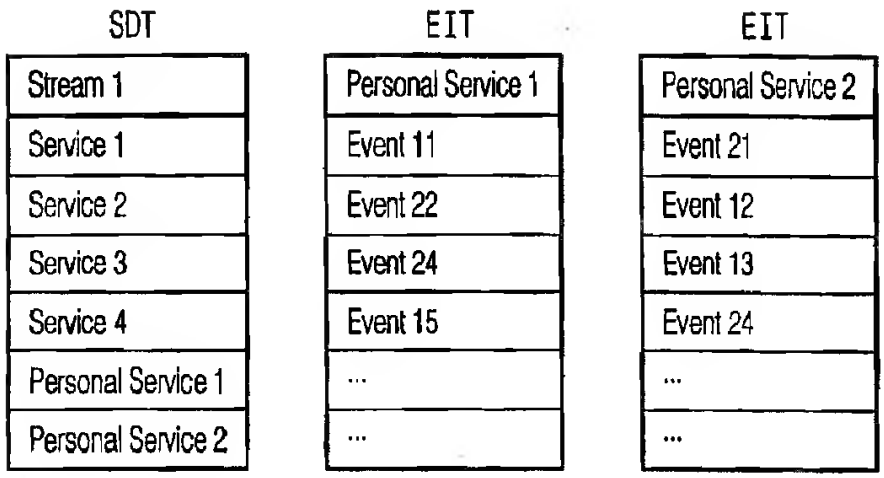

FIG. 2B

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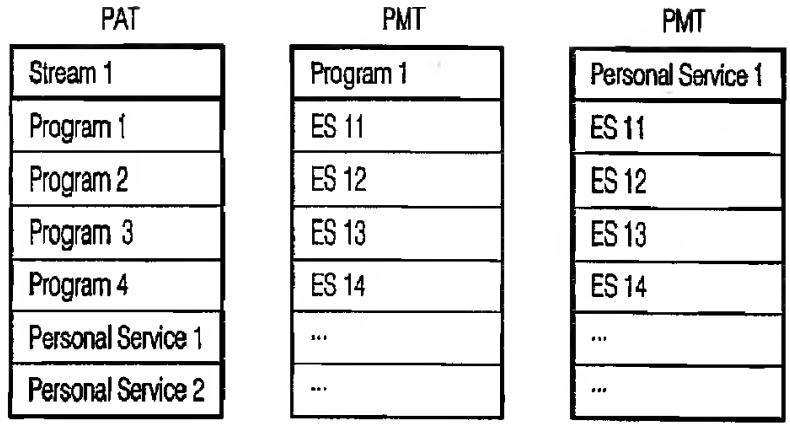

FIG. 3

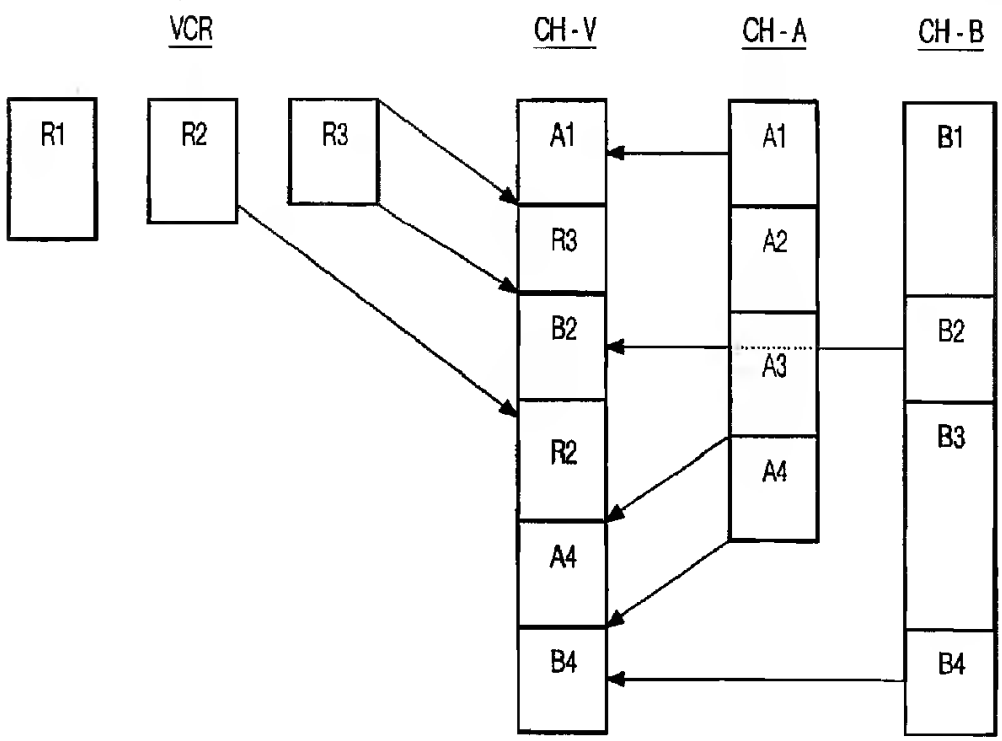

FIG. 4

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APPARATUS AND METHOD FOR RESCHEDULING PROGRAM CONFLICTS IN A VIRTUAL CHANNEL SCHEDULING GAP

FIELD OF THE INVENTION

The invention relates to an apparatus for receiving programs from a plurality of channels, comprising a tuner for tuning to any of the plurality of channels, and electronic program guide (EPG) means for presenting a schedule of the programs, the EPG means being adapted to present a schedule of a subset of said programs as being ostensibly scheduled for a personal channel.

The invention further relates to a method of receiving programs from a plurality of channels, comprising a step of presenting a program schedule for each channel, and a step of presenting a schedule of a subset of said programs as being ostensibly scheduled for a personal channel.

BACKGROUND OF THE INVENTION

An apparatus as defined above is known from U.S. Pat. No. 5,517,254. The known apparatus comprises an electronic program guide (EPG) for presenting a schedule of the programs. The EPG is presented to the viewer as a time-channel matrix, each column comprising a schedule for a particular channel at a particular day. The EPG enables a user to select desired programs to be recorded or to be reminded of. The apparatus may select programs automatically as a recommendation when they meet certain criteria. Channels may be presented in different order, e.g. in accordance with the number of selected programs. In a particular embodiment, all selected programs are collected in one column, as if they were scheduled for an ostensible personal channel, thus providing a quick overview of the selected programs.

OBJECT AND SUMMARY OF THE INVENTION

It is an object of the invention to provide an apparatus as defined above, providing improved ease-of-use with respect to selecting desired programs. To this end, the apparatus according to the invention is characterized in that the apparatus further comprises virtual channel means for creating a user selectable virtual channel for reproducing the programs of said subset, the apparatus being adapted to control the tuner to tune to a channel currently broadcasting a program of said subset. In this way, it is achieved that the user can actually select a virtual channel broadcasting the programs of the personal channel. The apparatus takes care of automatically tuning to the genuine channels broadcasting the programs compiled in the virtual channel. As a consequence, the user can view the desired programs by simply selecting the virtual channel, i.e. the virtual channel does not only provide a overview of selected programs, but also allows the programs to be navigated to automatically. No further user action is required, hence the usability of the apparatus is improved.

An advantageous embodiment of the apparatus according to the invention applies to digital television broadcasting, the channels being services of a digital broadcast stream which comprises for each respective service a service description relating a service identification to a plurality of program identifications. The embodiment is characterized in that the virtual channel means are adapted to insert a new service description into the broadcast stream, the new service description relating a new service identification to a plurality of program identifications identifying the programs of the virtual channel. In this way the virtual channel is created by merely manipulating the information tables describing the digital broadcast stream. Other components need not be adapted, since they perceive the additional virtual channel as a genuine channel. For example, the EPG will display the virtual channel as all other channels and when the user selects the virtual channel the apparatus will automatically select the right programs from the broadcast stream, since the virtual channel comprises program pointers which are duplicated from the original channels.

A preferred embodiment applies to the Digital Video Broadcasting (DVB) standard, which is widely applied. This embodiment is characterized in that the broadcast stream is a stream conformant to the Digital Video Broadcast (DVB) specifications, the service descriptions constituting the Service Description Table (SDT) of the DVB Service Information (SI). The virtual channel is created by inserting a new entry in the SDT, comprising a new service identification and duplicated pointers to the selected programs.

When programs are collected from multiple genuine channels, it may occur that some of the programs are broadcast simultaneously, hence cannot be viewed at the same time. An embodiment is characterized in that the apparatus further comprises scheduling means for assigning priority ratings to the programs of the virtual channel, for selecting a first program in favor of a second program when they are broadcast simultaneously and the first program has a higher priority rating than the second program. The priority ratings may be supplied by the user or assigned by the apparatus based on a user profile. For example, when the user has previously shown more interest in news programs than in sports programs, the system may assign a higher priority rating to the first category. The priority ratings are then used to decide which of the programs broadcast simultaneously have to be selected. An alternative embodiment is characterized in that the scheduling means are further adapted to record the second program, and reschedule it for the virtual channel to fill a gap before or after the programs scheduled for the virtual channel.

In this way the program which is of less interest to the user is recorded on a video recorder, and when at a later moment a substantial gap occurs in the schedule of the virtual channel, the recorded program is rescheduled to fill that gap. The apparatus is adapted to find the program on the video recorder and replay it at the appropriate time. Alternatively, the program with the highest priority rating could be recorded on the video recorder, ensuring that the user acquires a copy of the program which can be viewed even if the user is unable to watch the program when it is being broadcast.

An embodiment is characterized in that the virtual channel means are further adapted to store an identification of a default channel, and control the tuner to tune to said default channel when there is no program scheduled for the virtual channel. This provides an alternative way of filling gaps in the schedule of the virtual channel. When the user has selected the virtual channel while there is no program scheduled for that moment the tuner is controlled to tune to the default channel, but as soon as a program scheduled for the virtual channel starts, the tuner is controlled to tune to the genuine channel broadcasting said program.

An embodiment is characterized in that the apparatus further comprises user operable editing means for editing the priority ratings and/or the identification of the default channel and/or removing programs from and adding programs to

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the virtual channel. In this way, the user is enabled to control the program schedule of the virtual channel.

The automatic switching between genuine channels could be controlled by a clock in accordance with the start and stop times of the scheduled programs, or alternatively by processing signals from a service provider which indicate the start and stop times, e.g. signals of the Program Delivery Control (PDC) system.

An embodiment is characterized in that the virtual channel means are further adapted to create further user selectable virtual channels. For example, each member of a household may have a private virtual channel, possibly password protected. Alternatively, each virtual channel may be dedicated to programs of a particular category, e.g. there may be a virtual comedy channel, a virtual sports channel etc.

The invention is particularly suitable for television receivers, set-top boxes and video recorders, but could also be applied to radio receivers.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects of the invention will be apparent from and elucidated by way of a non-limitative example with reference to a drawing in which:

FIG. 1 shows a diagram of a digital television receiver as an embodiment of the apparatus according to the invention,

FIGS. 2*a* and 2*b* show examples of adaptations to DVB-SI information tables for creating a virtual channel,

FIG. 3 shows examples of adaptations to DVB-PSI information tables for creating a virtual channel,

FIG. 4 shows the composition of a program schedule for a virtual channel.

DESCRIPTION OF EMBODIMENTS

FIG. 1 shows a block diagram of a digital television receiver as an embodiment of the apparatus according to the invention. Digital broadcast streams, modulated upon radio frequency (RF) signals, are received from the ether by an antenna 1 or, alternatively, from a cable network. The broadcast streams may be formatted, for example, in accordance with the Digital Video Broadcasting (DVB) standard. A tuner 2 comprises a standard analog RF receiving device which is capable of receiving said RF signals and selecting one of them to be output to a demodulator 3. Which signal tuner 2 selects is dependent upon control data received from a central processing unit (CPU) 5. The demodulator 3 converts the analog signal into a digital packet stream, based on control signals received from the CPU 5. This packet stream is then output to a demultiplexer 4, which selects packets belonging to a particular program in accordance with control data received from the CPU 5, and decomposes the packet stream into elementary video, audio or data streams.

In an alternative embodiment of the invention, the packet stream is output from demodulator 3 directly to the CPU 5. In this embodiment, the CPU 5 performs the tasks of the demultiplexer 4, thereby eliminating the need for the demultiplexer 4.

A video processor 8 decodes the video stream received from the demultiplexer 4 or from the CPU 5. In preferred embodiments of the invention, the video processor 8 is an MPEG-2 decoder; however, any decoder may be used as long as the decoder is compatible with the type of coding used to code the video data. Decoded video data is then transmitted to a display screen 9. An audio processor 6 decodes the audio stream received from the demultiplexer 4. Again, any decoder may be used as long as the decoder is compatible with the type of coding used to code the audio data. Decoded audio data is then transmitted to a speaker system 7.

The demultiplexer 4 outputs the elementary data stream to the CPU 5. The elementary data stream has two types of data: control data and content data. Content refers to, e.g., interactive programs; control refers to tables in the multiplex which specify matters like the structure of the multiplex, the (RF) frequencies at which the channels are modulated, and the addresses at which the various content components and the (other) tables in the multiplex can be found. The CPU 5 comprises one or more microprocessors capable of executing program instructions stored in a read-only memory (ROM) 12. These program instructions comprise parts of software modules including, inter alia, a command module 13, an EPG module 14, a virtual channel module 15 and a scheduler module 16. Data processed by said software modules, e.g. DVB-SI data and user profile information, may be stored in a non-volatile memory 11. The command module 13 is capable of controlling functions of the TV-set, like tuning and demultiplexing selection, and transmitting data to the video processor 8 to be presented on the screen 9. A user command unit 10 receives user commands, e.g. through a remote control (not shown), and transmits them to the command module 13 to be processed. For example, when the user enters a channel number, the command module 13 controls the tuner 2 and the demultiplexer 4 to select the corresponding broadcast stream and data packets therein, and sends graphical data to the video processor 8 to present feedback on the screen 9, e.g. the preset number, the channel name being displayed for a few seconds.

A digital video recorder 17 is controlled by the CPU 5, and capable of storing and reproducing programs and DVB-SI data. It may be built in the television receiver or be a separate device under control of the television receiver.

Digital broadcast streams comprise information for describing the structure of the broadcast stream and generating navigation user-interfaces. For example, a DVB broadcast stream comprises Program Specific Information (PSI, part of the MPEG specifications) and SI information, necessary, inter alia, for decoding the program information and generating an electronic program guide. Specifications of the DVB standard are widely available and well known to those of ordinary skill in the art. Descriptions thereof are provided only if relevant for explaining the present invention.

The EPG module 14 interprets the DVB-SI data received from the demultiplexer 4 to collect information about the services available in the received broadcast streams and about the events scheduled for those services (DVB services are considered to be equivalent to the conventional notion of TV channels, while DVB events correspond to TV programs). For that purpose, the SI data comprises, for each broadcast stream, a Service Description Table (SDT) listing the names and other parameters of the services, or channels, available for that broadcast stream. For each service, an Event Description Table (EIT) describes the names and other parameters of events, or programs, scheduled for that service. The EPG module 14 uses the information from the SDT and EIT to generate an on-screen overview of programs scheduled for the channels in the received broadcast streams. It also allows the user to select programs to be viewed, recorded or reminded of. References to the selected programs are stored in the memory 11, which can be accessed by the virtual channel module 15. The virtual channel

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module **15** is capable of creating one or more virtual channels, featuring said selected programs stored in the memory **11**. The creation of said virtual channels is accomplished by manipulating the PSI and SI tables in such a way that the command module **13** and the EPG module **14** automatically recognize the new channels, thus evading the need for substantial adaptations of said modules.

FIG **2** schematizes the way SDT and EIT are adapted to create two virtual channels and schedule programs from genuine channels for the new virtual channels. FIG. **2***a* shows the situation before the adaptation. The SDT lists four services for a broadcast stream **1**. For two of those services an EIT section is shown, listing five events for both of them. FIG. **2***b* shows the situation after the adaptation. Two new services are added to the SDT, e.g. each being a private virtual channel of a different household member. The names of the new services may be generated by the virtual channel module **15** or supplied by the user. For both new services a new EIT section is created. The entries of the new EIT sections are duplicated from the original entries of the existing EIT sections. As can be seen, one event, in this case Event **24**, may occur in multiple virtual channels.

An EPG generated by the EPG module **14** in accordance with the adapted SI tables automatically shows the two new services. The events of the virtual channels are presented at least twice, because they are also scheduled for one of the genuine channels. To ensure that 'tuning' to a virtual channel automatically causes the appropriate events to be selected, similar adaptations should be made to the (MPEG part) PSI tables. Each program in the broadcast stream is described by an entry in a Program Association Table (PAT) and a corresponding section of a Program Map Table (PMT) which relates a program to the elementary data streams which constitute the program. Each entry in the SDT comprises a service identification which corresponds to a program identification in the PSI information. In order to bring the PSI information into agreement with the SI information, a new entry is added to the PAT and a new section is added to the PMT. FIG. **3** shows the situation after creating two virtual channels. The PAT is extended with program identifications which are identical to the identifications of the new services in the SDT, and two new PMT sections (only one of which is shown) are added referring to the newly added program identifications. The identifications of the elementary streams of the newly created PMT sections are duplicated from the PMT sections corresponding to the genuine channels. By adapting the PSI tables in this way, the demultiplexer **4** perceives the new virtual channels as ordinary broadcast channels, hence the virtual channels are processed just as normal channels.

For the sake of simplicity, only services belonging to one broadcast stream have been considered until now. However, it is noted that programs of services located in multiple broadcast stream may be scheduled for a single virtual channel. For every broadcast stream, the SDT comprises an entry for said virtual channel, while the EIT comprises sections with the events which are to be broadcast through said broadcast stream. Another DVB feature, the Bouquet Association Table (BAT) could be used to correlate the various parts of information related to the virtual channels. A BAT gives a logical grouping of services into bouquets, which may group together services delivered by different broadcast streams. Since the information related to a virtual channel may be organized across various SDT tables, the BAT provides a convenient instrument to assist operation and improve performance.

Because programs of a virtual channel may be obtained from multiple genuine channels, the schedule of the virtual channel is likely to comprise gaps and overlaps between the programs. In order to fill a gap, the virtual channel module **15** is capable of controlling the tuner **2** and the demultiplexer **4** to select a default channel. The identification of the default channel is stored in the memory **11**, and may be chosen or altered by the user, by means of editing means which are constituted by the user command unit **10** and an on-screen menu generated by the virtual channel module **15**. In order to deal with overlaps, the scheduler module **16** maintains a user profile for deciding which programs are likely to be preferred by the user and assign priority ratings accordingly. The user profile may be specified by means of habit watching or explicit user input. Dependent on the sophistication of the video recorder **17**, various options for dealing with gaps and overlaps are available. If the video recorder **17** is disconnected or has no storage capacity available, and a time conflict occurs between two or more programs, the one with the highest priority rating is selected for display. If storage capacity is available, the programs having the lower ratings are recorded onto the video recorder **17**. The scheduler module **16** further maintains a database of information about the programs available on the video recorder **17**, e.g. their title, duration and program category. If a gap is encountered in the schedule of the virtual channel, the scheduler module **16** searches the database for recorded programs having a length which is substantially equal to the length of the gap. If such programs are found, one of them is scheduled for the virtual channel to fill the gap. Alternatively, various shorter recorded programs are combined to fill the gap, or a longer recorded program is split into several parts, each filling a different gap in the schedule of the virtual channel, e.g. before and after a news bulletin. The scheduler module **16** may control the video recorder **17** to reproduce a program with slightly increased speed if it is just too long to fill a gap, in order to fill the gap exactly or leave a small pause of predetermined length, e.g. 5 minutes. Similarly, a program which is just too short to fill a gap may be reproduced with slightly decreased speed, to avoid long pauses between programs. If the video recorder **17** is capable of simultaneously recording a first program and reproducing a second program, a broadcast program may be shifted in time so that it starts only when the reproduction of a recorded program has ended. The scheduler module **16** is thus capable of solving time conflicts between programs which are broadcast via the received broadcast streams, by time-shifting the programs or inserting recorded programs.

FIG. **4** shows the composition of a program schedule for a virtual channel CH-V comprising programs from a video recorder VCR and two broadcast streams CH-A and CH-B. Program A1 from CH-A and program B2 from CH-B are scheduled for CH-V, leaving a gap between them. Program R3 from VCR is scheduled to fill that gap. Because the length of R3 is slightly longer than the length of the gap, the reproduction speed of R3 is increased to make it end a few minutes before the start of B2. Program R2 from VCR is scheduled after B2, and program A4 from CH-A is scheduled after R2, which is achieved by shifting it in time, i.e. recording it while VCR is reproducing R2. When R2 ends, VCR starts reproducing A4, while still recording the remainder of A4. The reproduction speed of A4 is increased to make up for the lost time, so that the subsequent program B4 need not be shifted in time anymore.

Although the invention has been described with reference to particular illustrative embodiments, variations and modifications are possible within the scope of the inventive concept. Thus, for example, the various software modules may be implemented and combined in several ways or

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located in different devices, e.g. a set-top box or a video recorder. The video recorder 17 may be a conventional video cassette recorder or an optical recording system. It may comprise a fast disk-cache or several read/write mechanisms for simultaneous recording and play-back. It may have an automatic loading mechanism for loading exchangeable data carriers such as video tapes and optical discs. Alternatively, the apparatus may generate messages to request the user to exchange data carriers.

In summary, the invention relates to an apparatus for receiving programs from a plurality of channels, comprising a tuner for tuning to any of the plurality of channels, and an electronic program guide (EPG) for presenting a schedule of the programs. The apparatus comprises virtual channel means for creating a user selectable virtual channel for reproducing selected programs from various genuine channels. The virtual channel means are adapted to control the tuner to tune to a channel currently broadcasting a selected program. When a user selects the virtual channel, the apparatus takes care of automatically switching between the genuine channels broadcasting the programs viewed on the virtual channel. As a consequence, the user can view the desired programs by simply selecting the virtual channel.

We claim:

1. An apparatus for receiving programs from a plurality of channels, comprising a tuner for tuning to any of the plurality of channels, and electronic program guide (EPG) means for presenting a schedule of the programs, the EPG means being adapted to present a schedule of a subset of said programs as being ostensibly scheduled for a personal channel, wherein the apparatus further comprises virtual channel means for creating a user selectable virtual channel for reproducing the programs of said subset, the apparatus being adapted to control the tuner to tune to a channel currently broadcasting a program of said subset;

wherein the apparatus further comprises scheduling means for assigning priority ratings to the programs of the virtual channel, for selecting a first program in favor of a second program when they are broadcast simultaneously and the first program has a higher priority rating than the second program; and

wherein the scheduling means are further adapted to record the second program, and reschedule it for the virtual channel to fill a gap before or after the programs scheduled for the virtual channel.

2. An apparatus as claimed in claim 1, the channels being services of a digital broadcast stream which comprises for each respective service a service description relating a service identification to a plurality of program identifications, wherein the virtual channel means are adapted to insert a new service description into the broadcast stream, the new service description relating a new service identification to a plurality of program identifications identifying the programs of the virtual channel.

3. An apparatus as claimed in claim 2, wherein the broadcast stream is a stream conformant to the Digital Video Broadcast (DVB) specifications, the service descriptions constituting the Service Description Table (SDT) of the DVB Service Information (SI).

4. An apparatus as claimed in claim 1, wherein the virtual channel means are further adapted to store an identification of a default channel, and control the tuner to tune to said default channel when there is no program scheduled for the virtual channel.

5. An apparatus as claimed in claim 1, wherein the apparatus further comprises user operable editing means for editing the priority ratings and/or the identification of a default channel and/or removing programs from and adding programs to the virtual channel.

6. An apparatus as claimed in claim 1, wherein the virtual channel means are further adapted to create further user selectable virtual channels.

7. An apparatus as claimed in claim 1 wherein said second program is displayed at an increased speed on said virtual channel when said second program is too long to fit within said gap between programs in said virtual channel.

8. An apparatus as claimed in claim 1 wherein said second program is displayed at a decreased speed on said virtual channel when said second program is too short to fill said gap between programs in said virtual channel.

9. An apparatus as claimed in claim 1 wherein said second program is time shifted so that said second program is displayed on said virtual channel after an end of a previous program on said virtual channel.

10. An apparatus as claimed in claim 9 wherein a first portion of said time shifted second program is displayed on said virtual channel while a second portion of said time shifted second program is simultaneously recorded for later display on said virtual channel.

11. A method of receiving programs from a plurality of channels, comprising the steps of:

presenting a program schedule for each channel, and

presenting a schedule of a subset of said programs as being ostensibly scheduled for a personal channel,

wherein the method further comprises the steps of:

creating a user selectable virtual channel for reproducing the programs scheduled for the personal channel,

assigning priority ratings to said programs of said virtual channel;

selecting a first program in favor of a second program when the first program and the second program are broadcast simultaneously and the first program has a higher priority than the second program;

recording the second program; and

rescheduling said second program for the virtual channel to fill a gap before or after the programs scheduled for the virtual channel.

12. A method as claimed in claim 11, the channels being services of a digital broadcast stream which comprises for each respective service a service description relating a service identification to a plurality of program identifications, wherein the method further comprises a step of inserting a new service description into the broadcast stream relating a new service identification to a plurality of program identifications identifying the programs of the virtual channel.

13. A method as claimed in claim 12 wherein the broadcast stream is a stream conformant to the Digital Video Broadcast (DVB) specifications, the service descriptions constituting the Service Description Table (SDT) of the DVB Service Information (SI).

14. A method as claimed in claim 11 further comprising the steps of:

using said virtual channel means to store an identification of a default channel; and

controlling the tuner to tune to said default channel, when there is no program scheduled for the virtual channel.

15. A method as claimed in claim 11 further comprising the step of:

using user operable editing means to one of:

edit the priority ratings, edit the identification of a default channel, remove programs from the virtual channel, and add programs to the virtual channel.

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16. A method as claimed in claim 11 further comprising the step of:

using the virtual channel means to create further user selectable virtual channels.

17. A method as claimed in claim 11 further comprising the step of:

displaying said second program at an increased speed on said virtual channel when said second program is too long to fit within said gap between programs in said virtual channel.

18. A method as claimed in claim 11 further comprising the step of:

displaying said second program at a decreased speed on said virtual channel when said second program is too short to fill said gap between programs in said virtual channel.

19. A method as claimed in claim 11 further comprising the step of:

time shifting said second program so that said second program is displayed on said virtual channel after an end of a previous program on said virtual channel.

20. A method as claimed in claim 19 further comprising the step of:

displaying a first portion of said time shifted second program on said virtual channel while simultaneously recording a second portion of said time shifted second program for later display on said virtual channel.

* * * * *

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APPENDIX F

A copy of U.S. Patent No. 6,470,356 to Suzuki.

US006470356B1

(12) **United States Patent**
Suzuki

(10) **Patent No.: US 6,470,356 B1**
(45) **Date of Patent: Oct. 22, 2002**

(54) **MULTIMEDIA INFORMATION AUDIOVISUAL APPARATUS**

(75) Inventor: **Nobuo Suzuki**, Nakai-machi (JP)

(73) Assignee: **Fuji Xerox Co., Ltd.**, Tokyo (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/385,031**

(22) Filed: **Aug. 30, 1999**

(30) **Foreign Application Priority Data**

Sep. 18, 1998 (JP) 10-264827

(51) **Int. Cl.**[7] **G06F 17/30**

(52) **U.S. Cl.** **707/104.1**, 707/100

(58) **Field of Search** 707/104.1, 100

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* cited by examiner

Primary Examiner—Greta Robinson
(74) *Attorney, Agent, or Firm*—Oliff & Berridge, PLC

(57) **ABSTRACT**

A multimedia information audiovisual apparatus which can suitably add mark information to streaming media and manage it and enables a user to see and listen to a presentation effectively. The multimedia information audiovisual apparatus comprises a media information management unit which manages media information including streaming media having a time axis, a reproduction scenario management unit which manages scenario information describing a combination in time and space of the media information for executing a presentation, a visual information reproduction unit which reproduces visual media information included in the media information, a sound information reproduction unit which reproduces sound media information included in the media information, and a scenario interpretation unit which reads the media information from the media information management unit based on the scenario information and causes the visual information reproduction unit or the sound information reproduction unit to reproduce the media information, wherein the apparatus further comprises a marking information management unit which manages marking information for relating the media information described in the scenario information, mark information related to the media information and a time duration in a presentation during which the mark information is related to the media information.

10 Claims, 7 Drawing Sheets

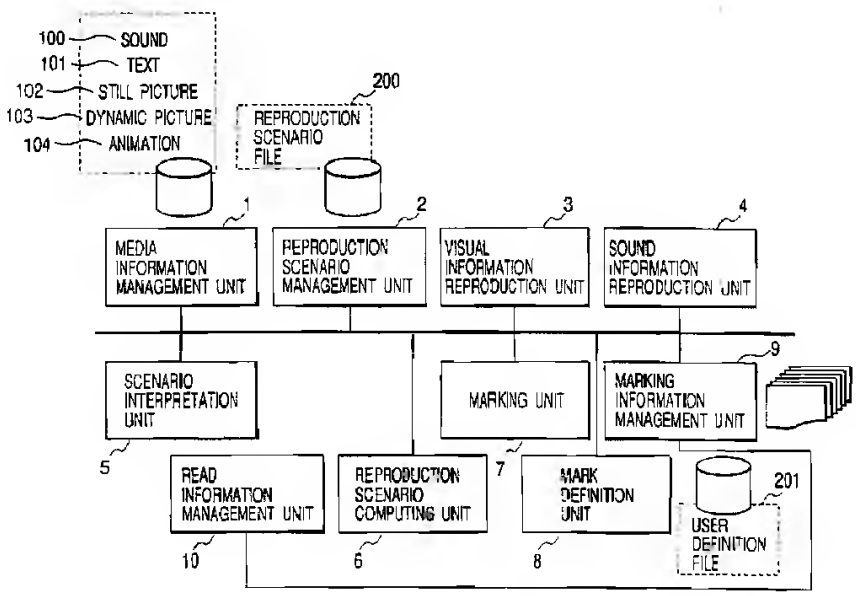

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FIG. 1

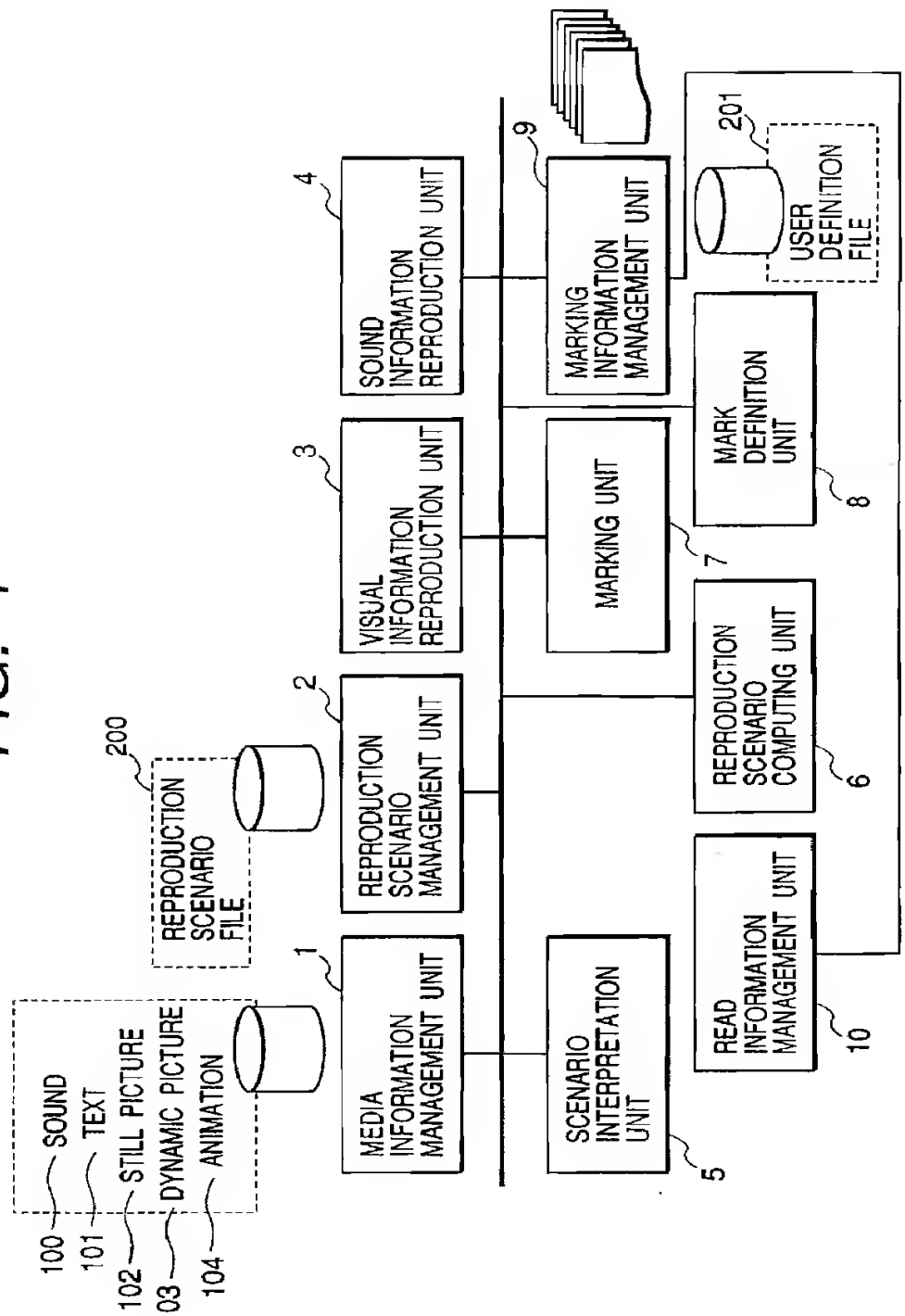

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FIG. 2

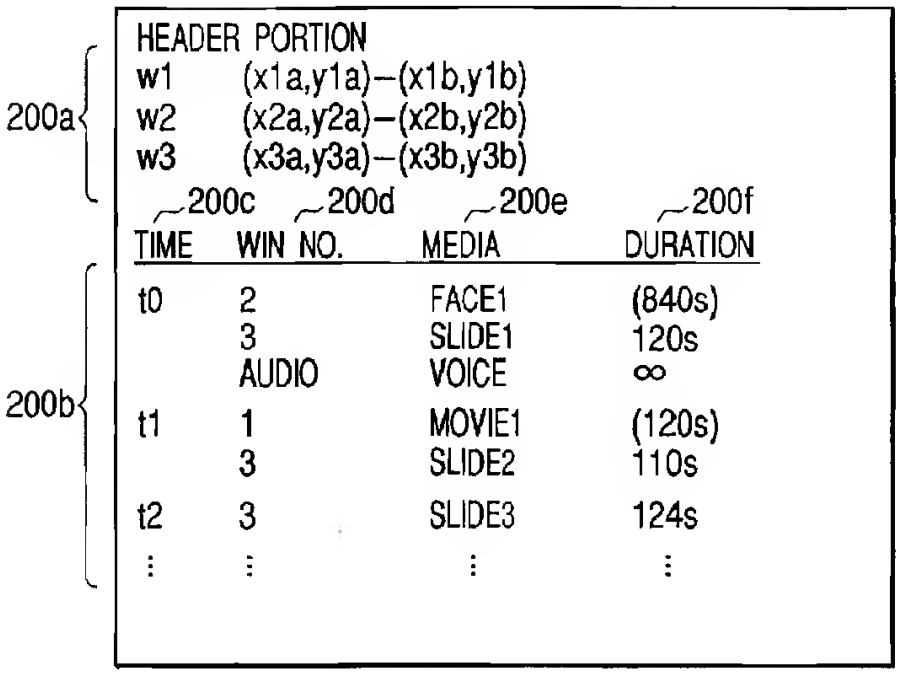

FIG. 3

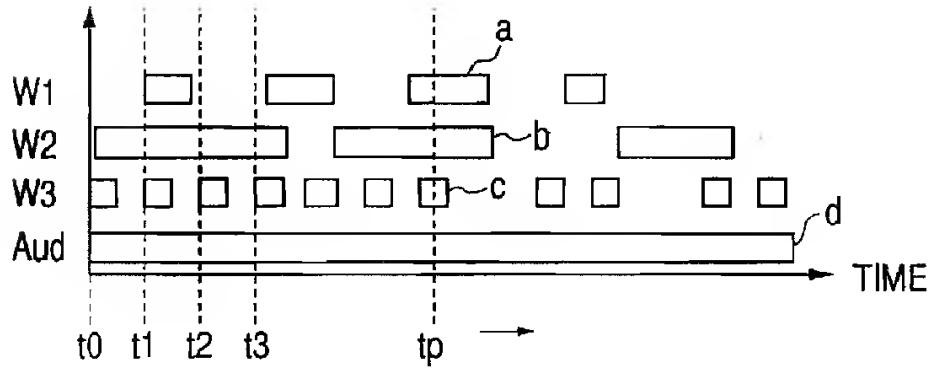

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FIG. 4

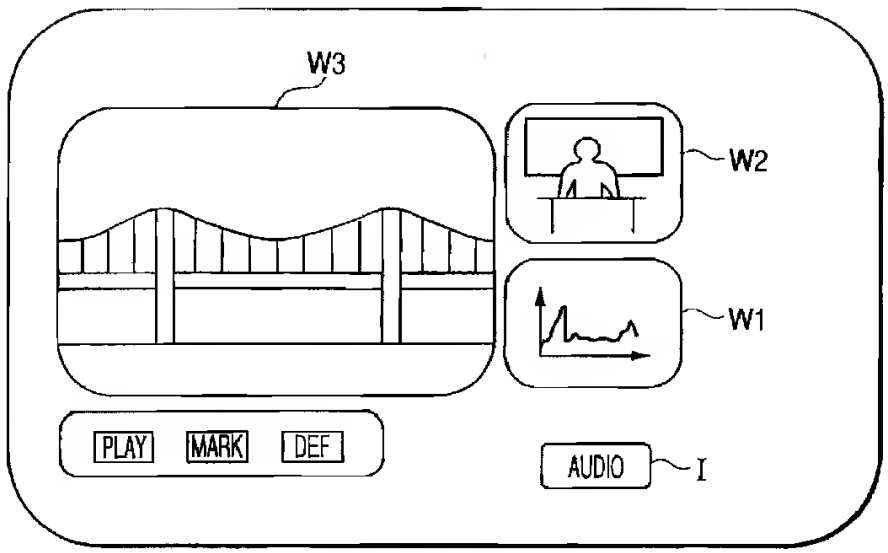

FIG. 6

SYMBOL	COMMENTS(TEXT)	PROCESSING	WHO ?
ALREADY	ALREADY SEEN OR HEARD	SKIP	DEFAULT
◎	IMPORTANT PORTION	—	DEFAULT
★	WILL SEE OR HEAR LATER	SLOW PLAY	ME
△	COMMON SENSE	FAST PLAY	ME
※	SHOULD BE CONSIDERED CAREFULLY	PAUSE	ME
:	:	:	:

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FIG. 5

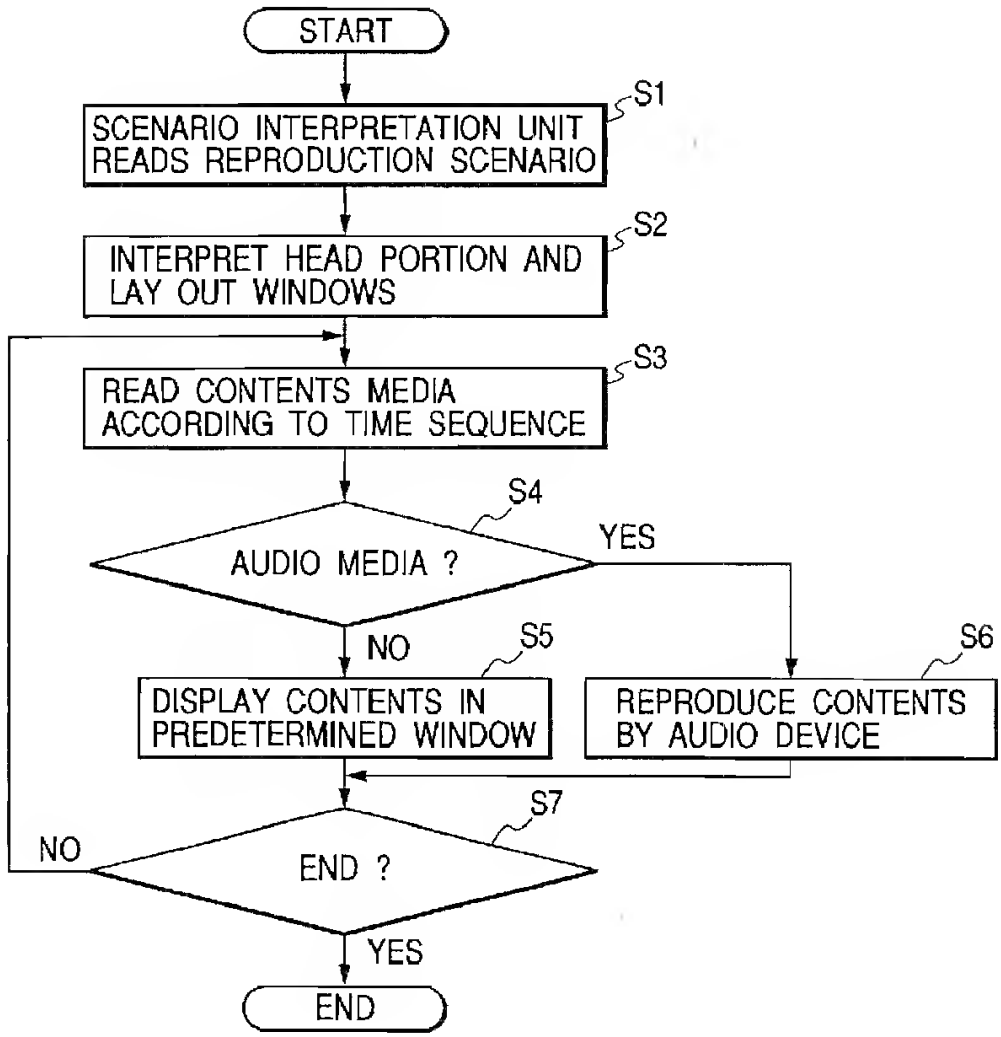

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FIG. 7

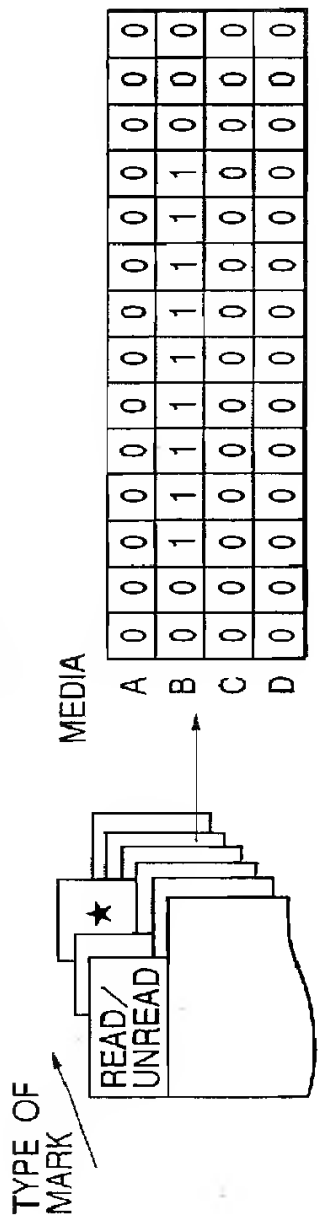

FIG. 8

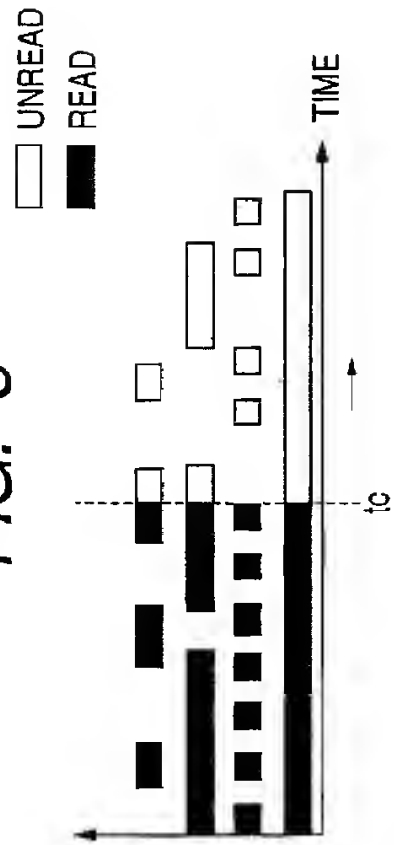

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FIG. 9

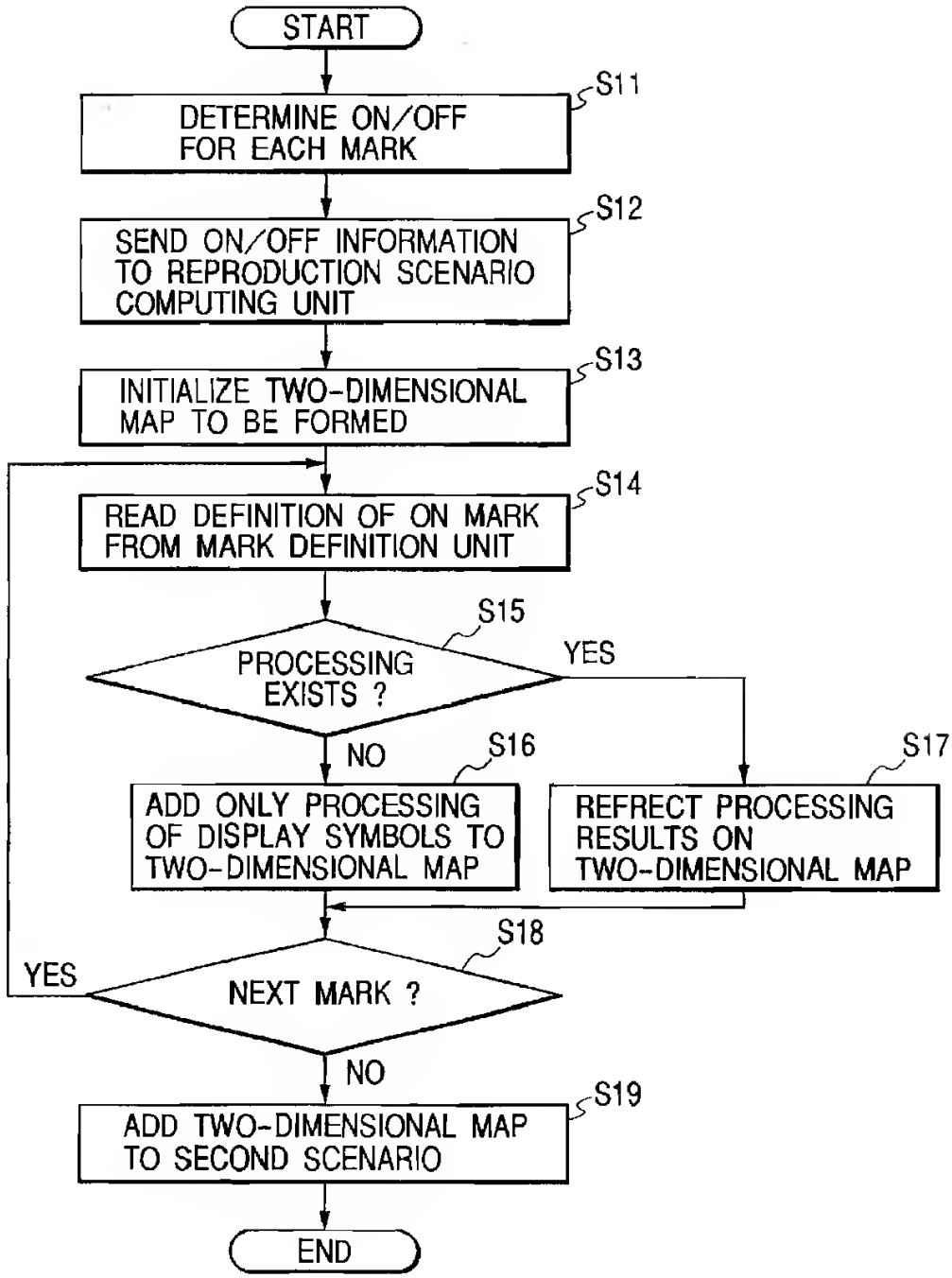

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FIG. 10

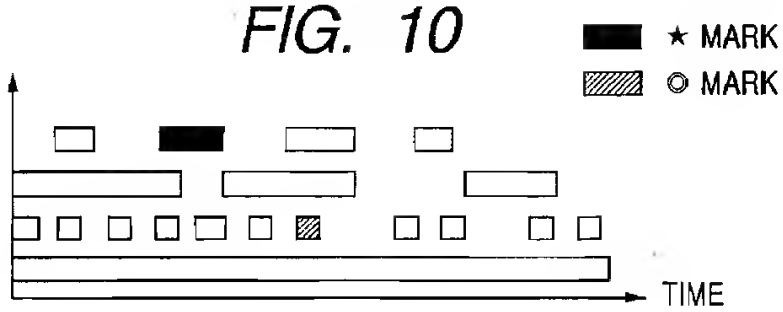

FIG. 11

0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	★	★	★	★	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	◎	◎
0	0	0	0	0	0	0	0	0	0	0	0	0	0

FIG. 12

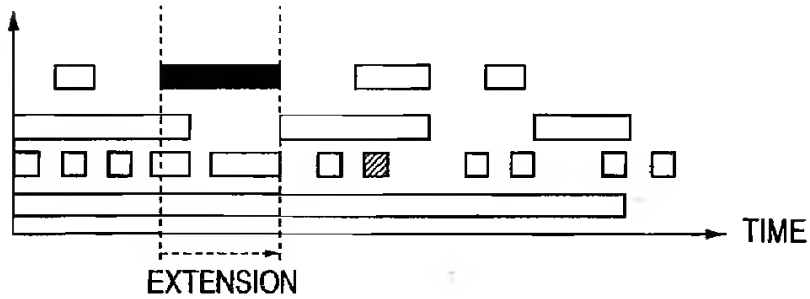

FIG. 13

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MULTIMEDIA INFORMATION AUDIOVISUAL APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a multimedia information audiovisual apparatus which enables a user to see and listen to a presentation composed of media information including document media such as still pictures and texts and streaming media such as sounds, dynamic pictures, animations and graphics.

2. Related Art

Heretofore, there has been proposed a system for marking, writing personal memos on or annotating a digital document like writing memos on or marking a printed document for feed-back to an author. In the future, such a technology for assisting editing work on digital documents will be becoming very important in such a scene that cooperation is carried out over a network along with the further expansion of a network and the popularization of multimedia documents.

A system capable of annotating a document consisting of pages such as a presentation using a so-called OHP is disclosed by Japanese Published Unexamined Patent Application No. Hei 5-189431. The system disclosed by this publication is able to annotate document media which do not include streaming media such as texts, figures and images without impairing the security of an original document. In this system, an annotation is written in a layer different from that of a document, thereby eliminating editing work on the original document. This is a technology which is made possible with digital documents.

A method for retrieving a point in a multimedia document is disclosed by Japanese Published Unexamined Patent Application No. Hei 8-235209. This publication teaches a method for specifying a certain point on the time axis of streaming media (time axis media) in order to retrieve a desired scene from multimedia information consisting of a plurality of media.

As described above, prior art technologies for specifying a certain point (in space or time) of a presentation and adding a "marker" or other information relate to document media mainly composed of pages. As for streaming media having a time axis, there exists only a technology for specifying a certain "point" on the time axis for the purpose of retrieval and there is not disclosed a technology for adding a "marker" to a certain range of streaming media.

A network conference which is carried out asynchronously for relatively long time (for example, several days or more) is taken into consideration.

When a user understands what happened while he/she was away from the network conference, he/she accesses the hysteresis of the conference and reads it, tracing the sequence of speeches made by other members. Since most of such network conferences are currently carried out using only text data, it is not so difficult to understand the progress of a conference by tracing the time sequence and reference link.

However, in the near future, network conferences will be carried out using multimedia and the opinions of speakers and materials are expected to be stored as multimedia information. Further, a conference system is expected to take multimedia minutes on a real-time basis. When a user who already saw and listened to such multimedia minutes is to see and listen to multimedia minutes which were updated after that, such a problem is conceivable that efficiency is extremely low because he/she has to see the same scene many times if he/she does not know which part was updated (not read) and which part he/she saw (read).

In the prior art, an unread part or read part of a presentation (media mixed presentation) a plurality of media of which are reproduced on multiple windows at the same time cannot be specified fully. That is, in the prior art, one point on the single time axis of a streaming medium can be specified. When mark information indicating a read part or unread part is added to the media mixed presentation, such contents as "from where to where (on the time axis)" and "which part of the presentation or which medium contents" are omitted.

In recent years, various general-purpose methods for processing digital documents have been proposed but a method for managing mark information to be added to streaming media or the like is yet to be reported.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a multimedia information audiovisual apparatus which can suitably add mark information to streaming media forming a presentation and manage the mark information. It is another object of the present invention to provide a multimedia information audiovisual apparatus which enables a user to see and listen to a presentation effectively.

The above objects of the present invention are attained by a multimedia information audiovisual apparatus comprising a media information management part which manages media information including streaming media having a time axis, a reproduction scenario management part which manages scenario information describing a combination in time and space of the media information for executing a presentation, a visual information reproduction part which reproduces visual media information included in the media information, a sound information reproduction part which reproduces sound media information included in the media information, and a scenario interpretation part which reads the media information from the media information management part based on the scenario information and causes the visual information reproduction part or the sound information reproduction part to reproduce the media information, wherein the apparatus further comprises a marking information management part which manages marking information for relating the media information described in the scenario information, mark information related to the media information and a time duration in a presentation during which the mark information is related to the media information.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

These and other objects and advantages of the present invention will become clear from the following description with reference to the accompanying drawings, wherein

FIG. 1 is a diagram showing the whole configuration of a multimedia information audiovisual apparatus according to an embodiment of the present invention;

FIG. 2 is a diagram showing an example of reproduction scenario file according to an embodiment of the present invention;

FIG. 3 is a diagram showing the scenes of a presentation according to an embodiment of the present invention;

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FIG. 4 is a diagram showing a display example of multimedia presentation according to an embodiment of the present invention;

FIG. 5 is a flowchart of basic multimedia reproduction operation according to an embodiment of the present invention;

FIG. 6 is a diagram showing a user definition file according to an embodiment of the present invention;

FIG. 7 is a diagram showing a marking information file according to an embodiment of the present invention;

FIG. 8 is a diagram showing scores based on the addition of unread and read mark information according to an embodiment of the present invention;

FIG. 9 is a flowchart of the operation of computing a reproduction scenario according to an embodiment of the present invention;

FIG. 10 is a diagram showing that added importance mark information and slow reproduction mark information are superimposed upon the scores of a reproduction scenario file according to an embodiment of the present invention;

FIG. 11 is a diagram showing a two-dimensional map computed based on added importance mark information and slow reproduction mark information according to an embodiment of the present invention;

FIG. 12 is a diagram showing scores obtained by computation based on added importance mark information and slow reproduction mark information according to an embodiment of the present invention; and

FIG. 13 is a diagram showing that scores obtained based on an updated scenario are superimposed upon scores obtained based on added unread and read mark information.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A multimedia information audiovisual apparatus according to an embodiment of the present invention will be described with reference to FIGS. 1 to 13. The whole configuration of the multimedia information audiovisual apparatus according to this embodiment will be first described with reference to FIG. 1. This multimedia information audiovisual apparatus presents multimedia information by combining multiple media information in time and space and reproducing them.

A media information management unit 1 stores media contents such as sounds **100**, texts **101**, still pictures **102**, dynamic pictures **103** and animations **104** as independent media.

A reproduction scenario management unit 2 stores a reproduction scenario file **200** describing a media time sequence and spatial layout for reproducing each medium of the presentation. An example of the reproduction scenario file **200** will be described with reference to FIG. 2. The reproduction scenario file **200** roughly consists of a header portion **200***a* and a body portion **200***b*.

The header portion **200***a* describes the layout of windows (three in FIG. 2) used in the presentation which is executed based on the reproduction scenario file **200**.

The body portion **200***a* describes which content (medium) is reproduced at which timing. Stated more specifically, the body portion **200***a* has an execution start time **200***c*, a window number **200***d*, a medium **200***e* and a reproduction time duration **200***f*.

A time for starting the reproduction of a medium is set in the execution start time **200***c*. A window number for reproducing a medium is set in the window number **200***d* when the medium to be reproduced is an image medium and "audio" is set in the window number **200***d* when the medium to be reproduced is a sound medium. The ID name of a medium to be reproduced is set in the medium **200***e*. In the reproduction time length **200***f*, in the case of a medium having no time axis such as a still picture, a time duration for displaying the medium is described. It is not necessary to describe anything in the reproduction time duration **200***f* when a streaming medium having a time axis such as dynamic picture/animation is reproduced at a normal speed. However, it is necessary to describe a total reproduction time when a medium is reproduced at a speed different from a normal speed, such as reproduction at a speed two times higher than the normal speed or a low speed.

When the reproduction scenario file **200** describes two or more media in the media **200***e* at the same execution start time, two or more media can be reproduced at the same time.

The concept of a reproduction schedule (score) of a multimedia presentation based on the reproduction scenario file shown in FIG. 2 will be described hereinunder with reference to FIG. 3 and FIG. 4. In FIG. 3, time is plotted on the axis of abscissas, space (window number or audio) for reproduction is plotted on the axis of ordinates, and each rectangle represents each medium. FIG. 4 shows a multimedia presentation at a time t=tp.

It is understood from FIG. 3 and FIG. 4 that, at a time t=tp, a medium "a" is reproduced on a window **W1**, a medium "b" is reproduced on a window **W2**, a medium "c" is reproduced on a window **W3** and a medium "d" is reproduced by audio equipment.

A description is subsequently given of the basic multimedia reproduction operation of this multimedia information audiovisual apparatus with reference to FIG. 5. This operation is started when a user presses a button "PLAY" for reproducing a presentation.

First, the scenario interpretation unit 5 reads the corresponding presentation reproduction scenario **200** from the reproduction scenario management unit **2** (step S1). Then, the scenario interpretation unit **5** reads the header portion **200***a* of the reproduction scenario **200** and acquires information on the layout of windows (step S2).

Thereafter, the scenario interpretation unit 5 reads from the top of the body portion **200***a*, reads a medium to be reproduced at a predetermined execution start time from the medium information management unit **1** (step S3) and detects whether the retrieved medium is a sound medium or not (step S4). When it is detected that the medium is not a sound medium but a visual medium, that is, a text **101**, still picture **102**, dynamic picture **103** or animation **104**, the medium is output to the visual information reproduction unit **4** together with window layout information for reproducing the medium. The visual information reproduction unit **4** creates a window based on the input window layout information and reproduces the input medium on the window (step S5).

When the medium read from the media information management unit **1** is a sound medium **100**, the medium is output to the sound information reproduction unit **4**. The sound information reproduction unit **4** reproduces sounds from a speaker based on the input medium (step S6).

The above processes (steps S3 to S6) are executed based on the description of the body portion **200***a*.

A description is subsequently given of media mark information contained in a presentation with reference to FIG. 6. FIG. 6 shows an example where mark information prepared

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as default and mark information defined by the user are contained in a single file (user definition file **201**).

The user definition file **201** is stored in the mark definition unit **8**. Each mark information contained in the user definition file **201** contains symbols (including sound information) representing each mark information perceptively, comments showing the contents of each mark information, link information on related information (for example, URL), processing methods for mark information (processing script), persons who defined the mark information and the like.

In the user definition file shown in FIG. **6**, there is defined mark information which is set by default, indicates that it is already seen or listened to and is symbolized by "already" and by which a skip will be made. There are also defined mark information which is set by default, indicates that it is important and is symbolized by ⊙, mark information which is set by a user (me), indicates that it should be reproduced later and is symbolized by ★ and by which it will bereproduced slowly, mark information which is set by a user, indicates that it is common information and is symbolized by Δ and by which it will be reproduced fast. There are further defined mark information which is set by a user, indicates that it should be considered carefully and is symbolized by X and by which a pause will be made, and the like. Mark information can be defined by a user using the mark definition unit **8**. Thereby, the user can prepare his/her own presentation by customizing or personalizing a presentation as required and can see and listen to it.

It is recommended to define general mark information in advance. For example, when mark information indicative of importance (symbol ⊙) is defined and added to an important medium that the author of a presentation wants to be seen, the symbol ⊙ can be displayed for the medium having the mark information at the time of reproducing the medium of the presentation and a receiver can pay attention to the medium. Time can be saved by reproducing only a medium having the mark information.

A description is then given of the operation of adding mark information to a medium included in a presentation.

When a user wants to add mark information to a specific medium while the presentation is executed, the marking unit **7** is used to specify a desired medium of the presentation reproduced by the visual information reproduction unit **4** to add mark information by means of the marking information management unit **9** as will be described hereinafter. Mark information can be added to an audio medium by specifying the icon (icon I in FIG. **4**) of an audio medium in a presentation window. Mark information to be added can be selected from a plurality of marks registered in the mark definition unit **8** by the marking unit **7** and a plurality of different mark information can be added to the same medium at the same time.

For example, to add mark information symbolized by ★, the symbol ★ of the mark information is selected using the marking unit **7** and the mouse of the marking unit **7** is clicked while the symbol is moved to and located on a desired medium, thereby adding the mark information (symbol ★) to the medium at its time. To add mark information to a desired medium for a desired time duration, the mouse of the marking unit **7** is clicked down for the desired time duration.

To add a plurality of contents to the same medium at the same time, a plurality of mark information are added, or another definition is added to mark information which has already been added. To add a plurality of mark information, a presentation is rewound and reproduced and other mark information is added. To add another definition to mark information which has already been added, a plurality of definitions are given to the mark information by the mark definition unit **8**. Mark information which has been already added can be redefined by the mark definition unit **8** so that the meaning of the mark information can be changed. For example, if the definition of processing is deleted when the defined processing is not necessary any more, the processing is not made on a portion having mark information for the processing. This cut labor and time required for changing the added mark information one by one.

An example of a marking information file for adding mark information to a medium at a predetermined time and managing it will be described hereunder with reference to FIG. **7**. In this embodiment, a marking information file which consists of two-dimensional maps is used to make comprehensible the relationship between the marking information file and the reproduction scenario of a presentation.

The marking information file has layers corresponding to the number of mark information and each layer stores data on the addition of mark information. Each layer is a two-dimensional map plotting time on the axis of abscissas and media on the axis of ordinates. The sampling interval of the time of the axis of abscissas is any interval (for example, 1 second). In FIG. **7**, each layer has 1-bit information having a time duration of 1 second for each medium. In the initial state, all the bits of the layer are "0".

A description is subsequently given of the operation of adding mark information.

The marking information management unit **9** sets the bits of the corresponding medium and time to "1" based on an instruction from the marking unit **7**. For example, supposing that a user specifies the mark ★ for a time duration of from 2 to 10 seconds for a medium B by means of the marking unit **7**, bits **2** to **10** of the line of the medium B of the layer of the mark information corresponding to the mark ★ are all set to "1" as shown in FIG. **7**.

Thus, computation can be carried out with ease by managing mark information to carry out processing defined by mark information as will be described hereinafter.

The operation of adding mark information (unread and read mark information) indicating that the already reproduced media has been read will be described hereunder.

The operation of adding the unread and read mark information to a medium is carried out by starting the reproduction of a presentation while a user turns on the option of putting unread and read marks.

In this operation, the above-described basic multimedia reproduction operation shown in FIG. **5** is carried out, the scenario interpretation unit **5** reads corresponding media based on a reproduction scenario **200**, and the visual information reproduction unit **3** and the sound information reproduction unit **4** reproduce the media. Along with this operation, the read information management unit **10** detects which part of each medium has been reproduced as shown in FIG. **8** and sets bits corresponding to the detected media and time of the layers of the unread and read mark information of the marking information file to "1".

A description is subsequently given of the operation of reproducing a presentation when a user suspends the reproduction of a presentation at a time te shown in FIG. **8** and gives an instruction to reproduce the subsequent part of the presentation.

When the user instructs the formation of a scenario for only unread portions to the reproduction scenario compiling

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unit 6, the reproduction scenario computing unit 6 reads a marking information file from the marking information management unit 9, interprets the layer of the unread and read mark information and forms a reproduction scenario containing only unread portions

Stated more specifically, the reproduction scenario computing unit 6 converts the scenario file of the corresponding presentation into scores and obtains a two-dimensional map showing the relationship between each medium and the reproduction time of each medium based on the scores. Thereafter, the layer of unread and read mark information is retrieved from the marking information file. AND of the former and the latter is computed and only read portions are retrieved. Then, the reproduction scenario computing unit 6 retrieves processing (the processing of skipping the reproduction of a medium) contained in the unread and read mark information from the user definition file 201 of the mark defining unit 8, obtains scores for the processing of skipping read portions and reconverts the score into a scenario.

By the above operation, a scenario for skipping the read portions and not other portions, that is, a scenario file for reproducing only unread portions is formed.

When the reproduction of a presentation is carried out using this formed reproduction scenario file as shown in FIG. 5, the presentation is reproduced from a time tc.

A description is subsequently given of the operation of reproducing a presentation based on the addition of a plurality of mark information with reference to FIG. 9.

The marking information file of the marking information management unit 9 has layers of important mark information (symbol ○) added by the author and slow reproduction mark information (symbol ★) added by a user for slow reproduction. Each mark information is added as shown in FIG. 10 when it is converted into scores for normal reproduction. Further, the processing of importance mark information is not defined whereas the slow reproduction processing of slow reproduction mark information is defined in the user definition file 201.

When the user instructs the reproduction of a presentation and whether each mark information whose layer is managed by the marking information management unit 9 should be made effective in the reproduction of the presentation (On, Off) is input (step S11), (On, off) for each mark information is sent to the reproduction scenario computing unit 6 (step S12). In this embodiment, slow reproduction mark information and importance mark information are set On.

Thereafter, the reproduction scenario computing unit 6 initializes a two-dimensional map to be formed (step S13), reads mark information which is set On from the user definition file 201 of the mark definition unit 8 (step S14) and detects whether the processing of the mark information is defined or not (step S15). As a result, when the processing is not defined, the reproduction scenario computing unit 6 adds the processing of displaying a symbol at a position of the two-dimensional map corresponding to bits which are set to "1" of the layer (step S16). Thereby, the processing of displaying a symbol at the position of the two-dimensional map corresponding to bits which are set to "1" of the layer of the importance mark information has been added. When the processing is defined, the reproduction scenario computing unit 6 reflects the defined processing on the two-dimensional map (step S17). Thereby, portions corresponding to bits which have been set to "1" of the layer of the slow reproduction mark information are reflected on the two-dimensional map so that they are reproduced by extending the time axis.

The above steps (steps S14 to S17) are carried out on all mark information which have been set On (step S18). Thereby, a two-dimensional map containing a plurality of mark information added as shown in FIG. 11 is formed. In FIG. 11, ◎ indicates that the processing of displaying a symbol is carried out and ★ indicates that slow reproduction is carried out. Thereafter, the reproduction scenario computing unit 6 creates scores based on the two-dimensional map. That is, the processing of displaying a symbol is carried out at a portion corresponding to ◎ of the two-dimensional map and scores are formed to carry out slow reproduction at a portion corresponding to ★. Thereby, scores as shown in FIG. 12 are created that the time axis having slow reproduction mark information of the scores shown in FIG. 10 is extended. Thereafter, a reproduction scenario file is formed based on the scores created by the reproduction scenario computing unit 6 (step S19). In the reproduction of a portion having importance mark information, a reproduction scenario file is described such that a symbol ◎ is displayed in the window during the reproduction of the portion.

When the scenario interpretation unit 5 executes a presentation based on the above formed reproduction scenario file, slow reproduction is carried out at the portion (time) having slow reproduction mark information and the symbol ◎ is displayed at the portion having importance mark information in the display window of the corresponding medium contained in the presentation.

At this point, the time for displaying the symbol ◎ corresponding to importance mark information is preferably made longer than a time having the importance mark information. Particularly preferably, the symbol is displayed before the time having the importance mark information. This is because the user adds importance mark information by means of the marking unit 7 during the reproduction of a presentation and there is a time gap between the time when the user finds an important portion during reproduction and the time when the user actually adds the importance mark information.

In the above processing, there can be a case where different mark information are added to the same portion of scores and the processes of the mark information cannot be carried out at the same time. In this case, the processing may be carried out based on the priority order of these mark information. For example, it is easy to determine the priority order of mark information by changing the order of computation.

A description is subsequently give of the processing of detecting an unread medium when a new medium is added in a read range of a scenario file.

First, the reproduction scenario computing unit 6 converts a reproduction scenario file into scores, retrieves the layer of unread and read mark information from the making information management unit 9, and forms a two-dimensional map corresponding to the scores based on the layer. Then, the reproduction scenario computing unit 6 masks the two-dimensional map with the unread and read mark information, superimposes the scores of the reproduction scenario upon it and detects unmasked portions. FIG. 13 shows that the two-dimensional map is masked with the unread and read mark information and superimposed by the scores of the reproduction scenario. As shown in FIG. 13, unmarked portions indicate newly added contents or unread contents. In this way, a newly added medium can be easily detected and can be reproduced without fail.

Thus, the user can freely add mark information such as annotation, memo or medium processing to a specific por-

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tion of a complex presentation consisting of a plurality of media. Read and unread portions can be managed fully, important portions of a presentation can be easily grasped, and it is possible to efficiently see or listen to the presentation.

According to the present invention, mark information can be suitably added to a streaming medium constituting a presentation and managed, and it is possible to effectively see and listen to the presention.

What is claimed is:

1. A multimedia information audiovisual apparatus, comprising:

a media information management part that manages media information including streaming media having a time axis,

a reproduction scenario management part that manages scenario information describing a combination in time and space of said media information for presenting within a space each media executed at a point in time for each point along the time axis,

a visual information reproduction part that reproduces visual media information included in said media information;

a sound information reproduction part which reproduces sound media information included in said media information;

a scenario interpretation part that reads said media information from said media information management part based on said scenario information and causes said visual information reproduction part or said sound information reproduction part to reproduce the media information; and

a marking information management part that manages marking information for relating said media information described in said scenario information, mark information related to the media information and a time duration in a presentation during which said mark information is related to said media information.

2. The multimedia information audiovisual apparatus according to claim 1, wherein said mark information contains at least one information selected from symbols representing mark information, text information, link information and a processing script.

3. The multimedia information audiovisual apparatus according to claim 2, wherein said mark information contains information indicative of an already reproduced range of said media information, and said marking information management part manages marking information for said mark information, said already reproduced media information and a time duration during which the media information has been reproduced.

4. The multimedia information audiovisual apparatus according to claim 2, wherein said visual information reproduction part or said sound information reproduction part reproduces and displays said symbols contained in said mark information added to the media information for said time duration having the mark information during the reproduction of said media information.

5. The multimedia information audiovisual apparatus according to claim 4, wherein said scenario interpretation part reproduces said symbols for a time duration longer than said time duration having said mark information.

6. The multimedia information audiovisual apparatus according to claim 1, wherein said apparatus further comprises a mark definition part that defines information contained in said marking information management part.

7. The multimedia information audiovisual apparatus according to claim 1, wherein said apparatus further comprises a marking part that specifies a time duration for adding predetermined mark information to said media information being reproduced, and said marking information management part manages said media information, said mark information and said specified time duration as marking information.

8. The multimedia information audiovisual apparatus according to claim 1, wherein said apparatus further comprises a reproduction scenario computing part that reproduces second scenario information based on said mark information, said marking information and said scenario information, and the reproduction scenario interpretation part reproduces media information based on said second scenario information.

9. The multimedia information audiovisual apparatus according to claim 8, wherein said reproduction scenario computing part creates said second scenario information by interpreting and processing a processing script contained in said mark information.

10. The multimedia information audiovisual apparatus according to claim 8, wherein said reproduction scenario computing part detects media based on said mark information, said marking information and said scenario information.

* * * * *

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APPENDIX G

A copy of U.S. Patent No. 5,953,005 to Liu.

US005953005A

United States Patent [19]

Liu

[11] Patent Number: 5,953,005

[45] Date of Patent: Sep. 14, 1999

[54] **SYSTEM AND METHOD FOR ON-LINE MULTIMEDIA ACCESS**

[75] Inventor: **James C. Liu**, Sunnyvale, Calif.

[73] Assignee: **Sun Microsystems, Inc.**, Mountain View, Calif

[21] Appl. No.: **08/671,581**

[22] Filed: **Jun. 28, 1996**

[51] **Int. Cl.**[6] **G06T 1/00**

[52] **U.S. Cl.** ..... **345/302**; 380/25; 434/307 A

[58] Field of Search ..... 707/501, 513, 707/529, 542; 345/302, 329, 335, 326, 434/307 R, 307 A; 463/30–35, 395/200.47, 200.48, 200.49, 200.33, 187.01, 186; 380/23, 25

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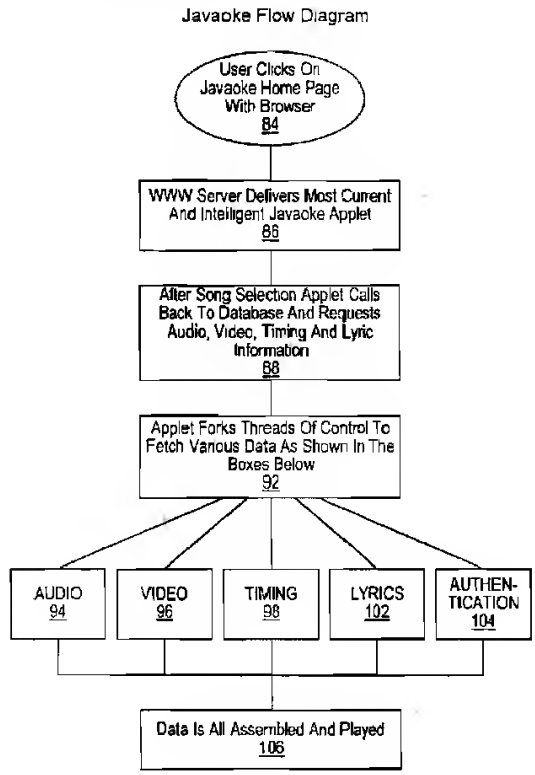
Primary Examiner—Joseph H. Feild

Attorney, Agent, or Firm—Conley, Rose & Tayon, PC; B. Noel Kivlin

[57] **ABSTRACT**

A method and system for providing access to multimedia content on line which is updated virtually simultaneously with the vendor's update process. By a user accessing a page on the World Wide Web, for example, data (encrypted and unencrypted) and instructions are automatically downloaded to a user's computer system for quick access. Depending upon the user's computer system (LAN or a stand-alone personal computer), "applets" containing data and instructions are stored for immediate access. In a Karaoke application of this invention, where the user desires to access songs which are most popular at a given time, the user accesses a page where a song list and other information is displayed on a display apparatus. When the user clicks on a particular song of the song list, the applet executes an authentication request. If the user is authenticated, the authentication is downloaded as part of the applet containing the desired multimedia content (or separately depending upon the circumstances). According to this invention, an applet includes multimedia elements which further include timing codes and a synchronization function which provides for the synchronization of the delivery of the multimedia elements.

45 Claims, 10 Drawing Sheets



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Javaoke Network Diagram

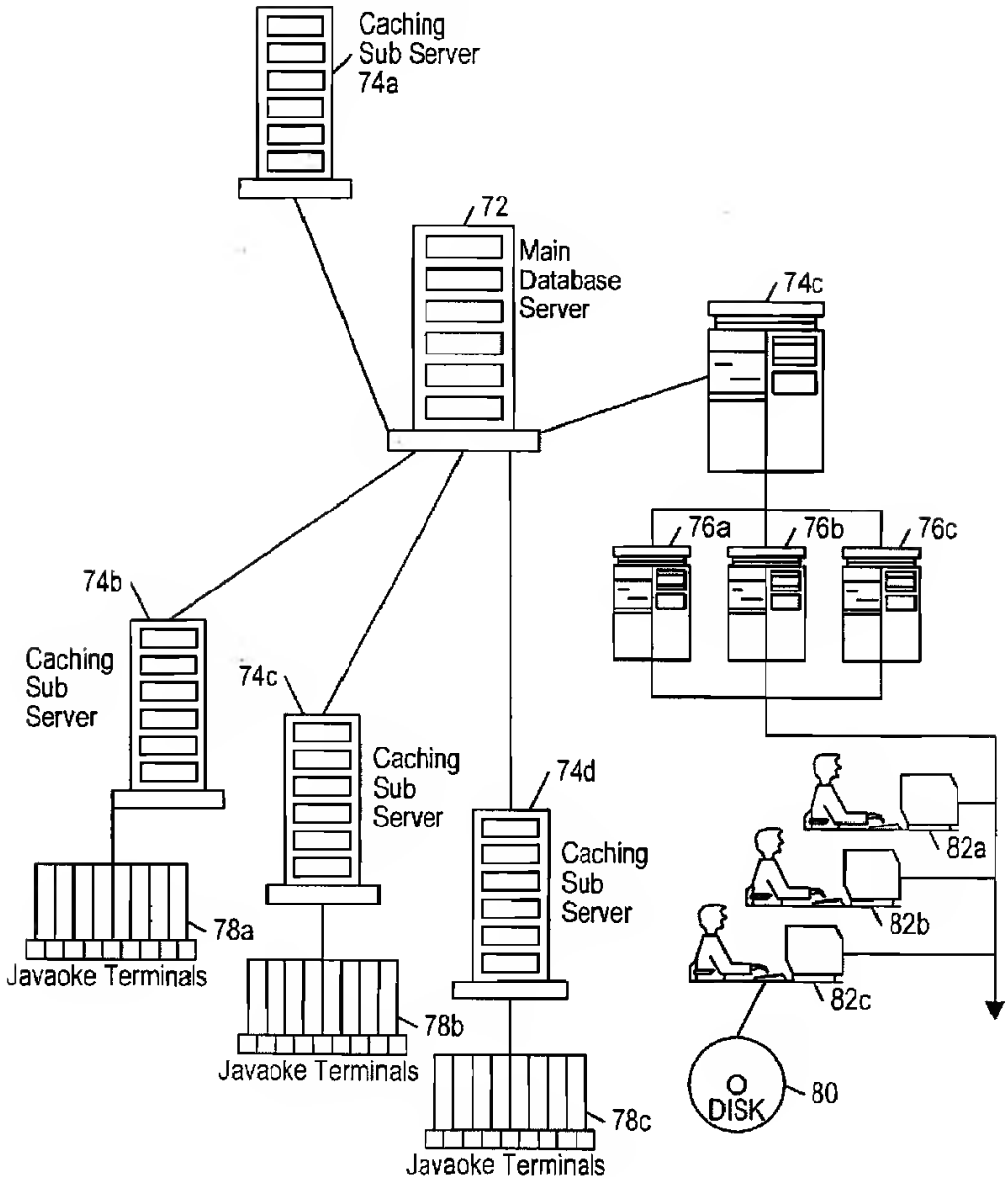

FIG. 1

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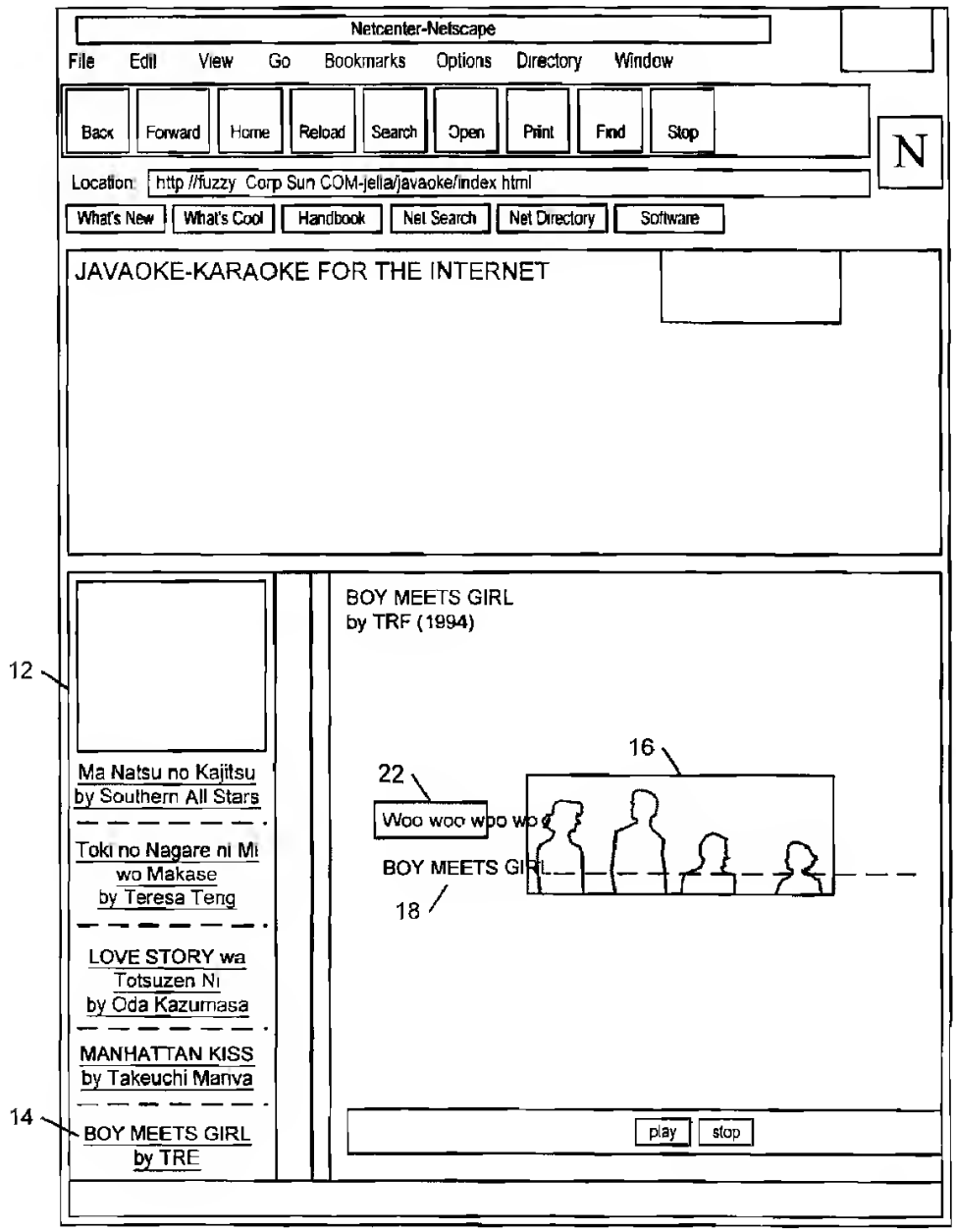

FIG. 2

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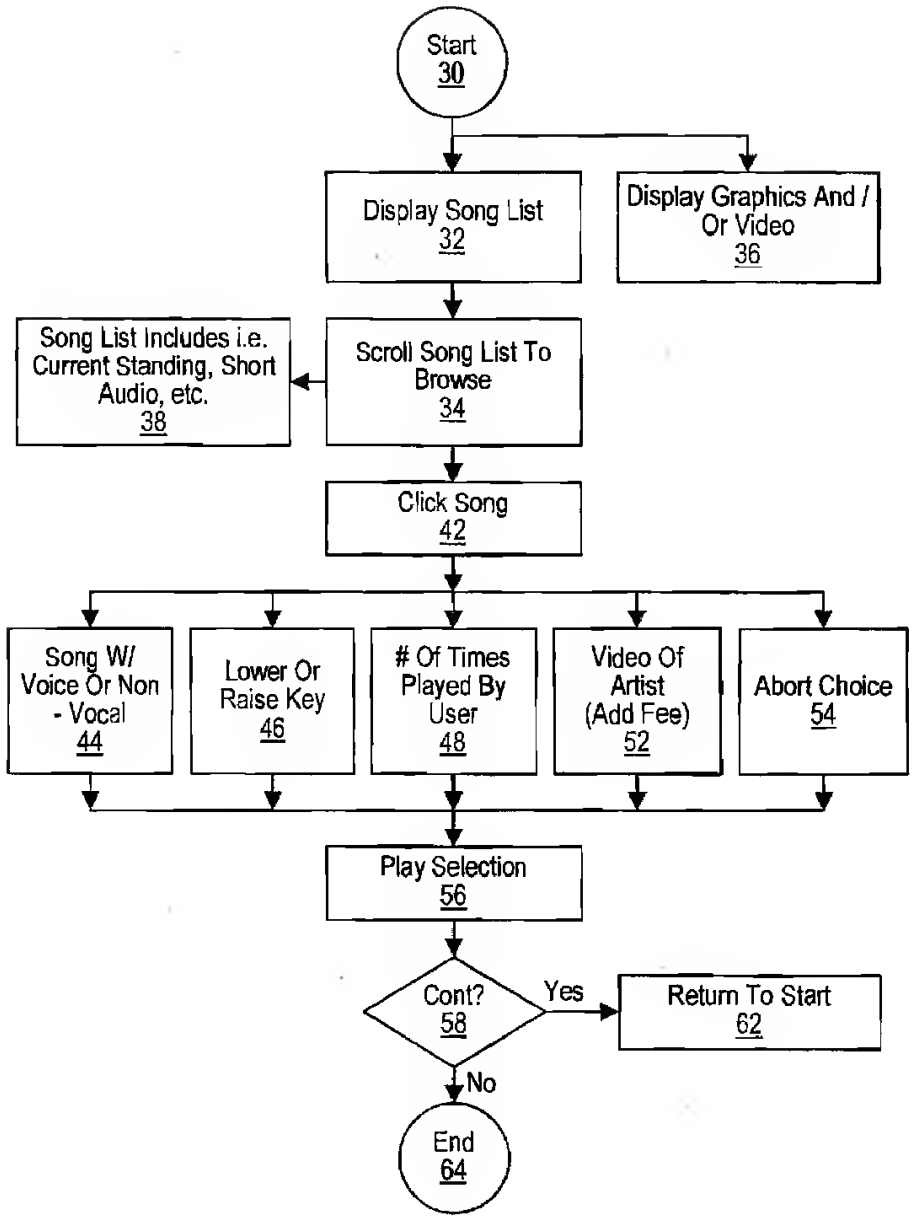

FIG. 3

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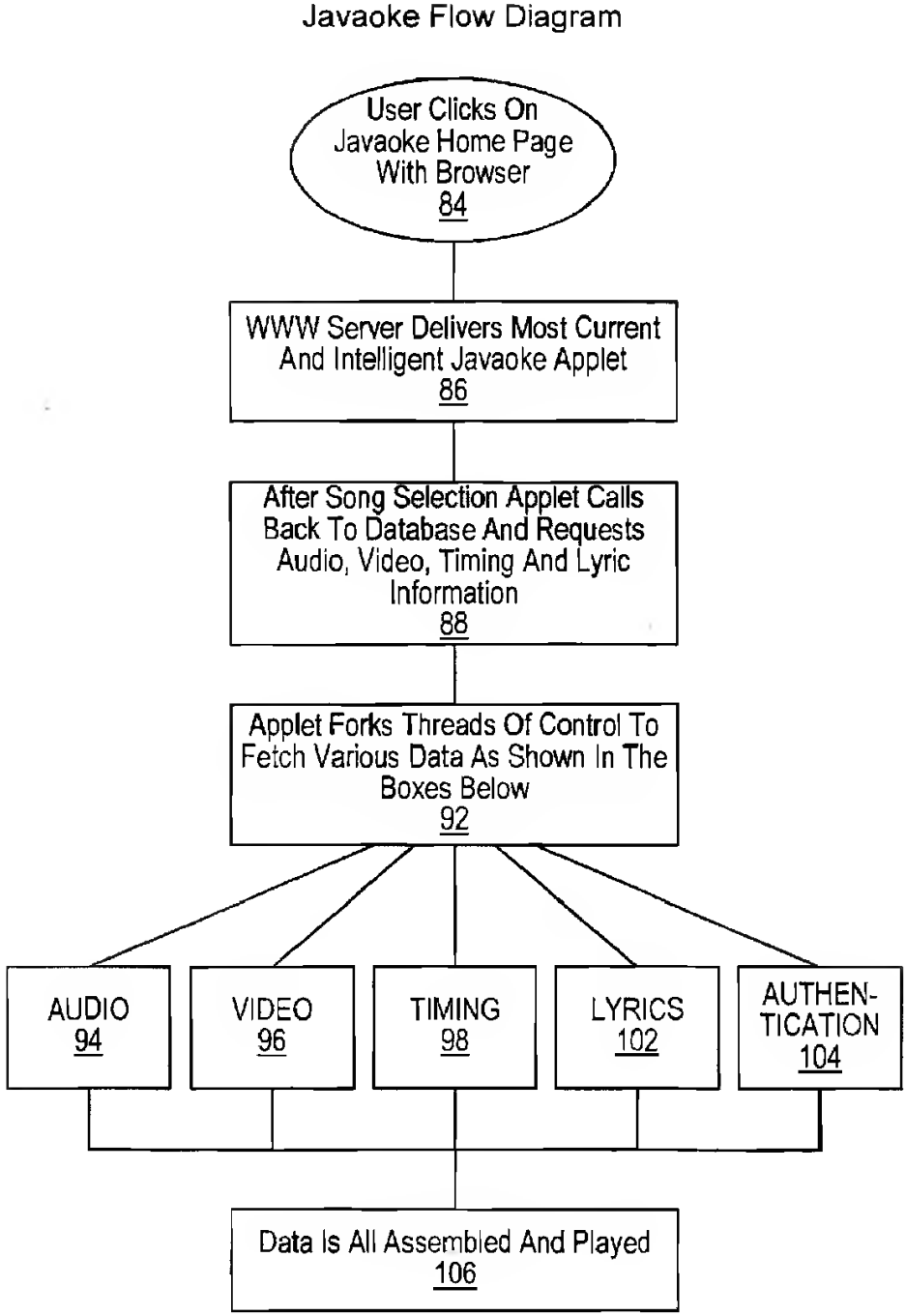

FIG. 4

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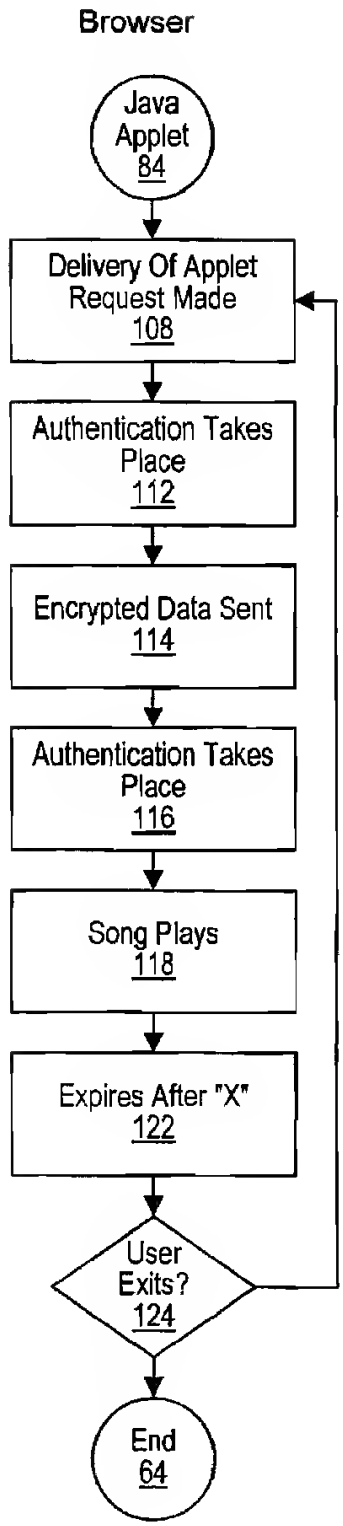

FIG. 5

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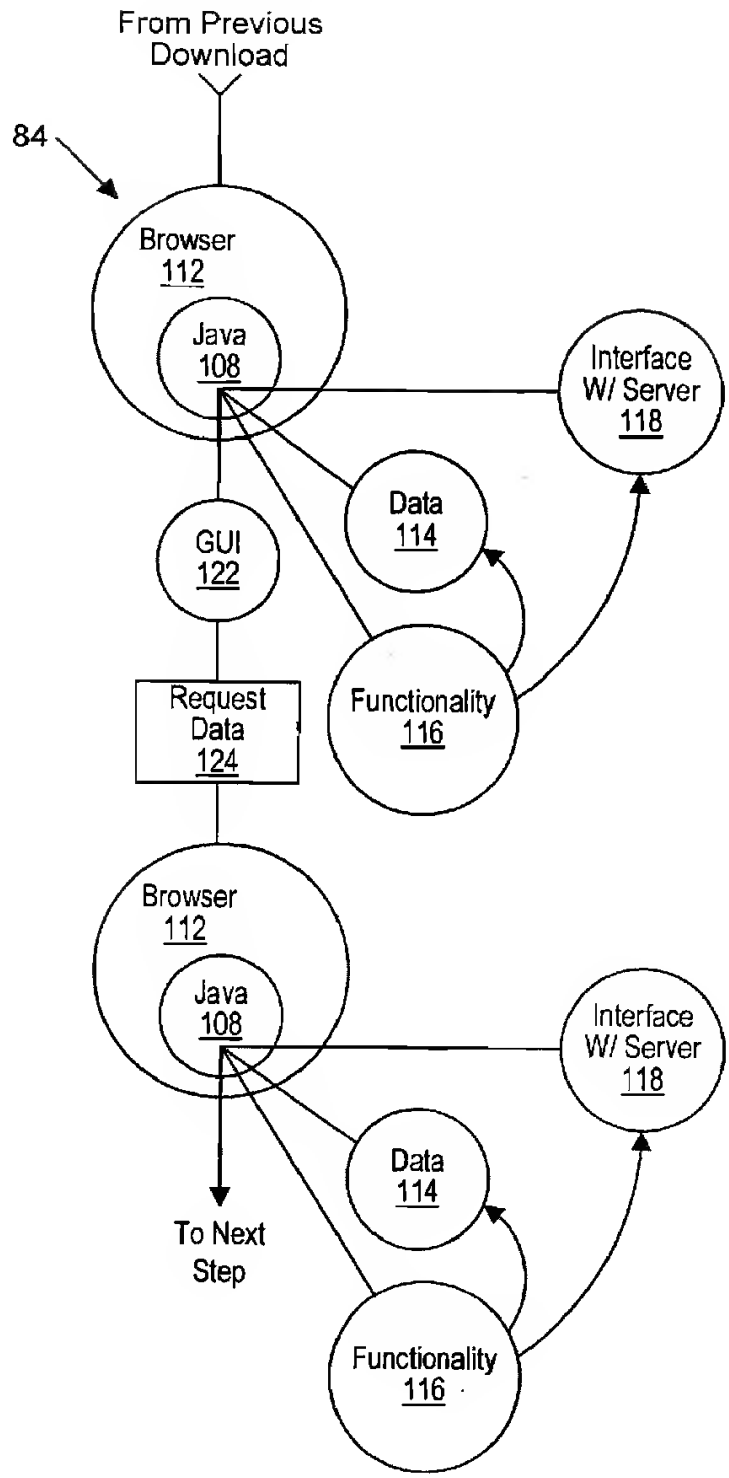

FIG. 6

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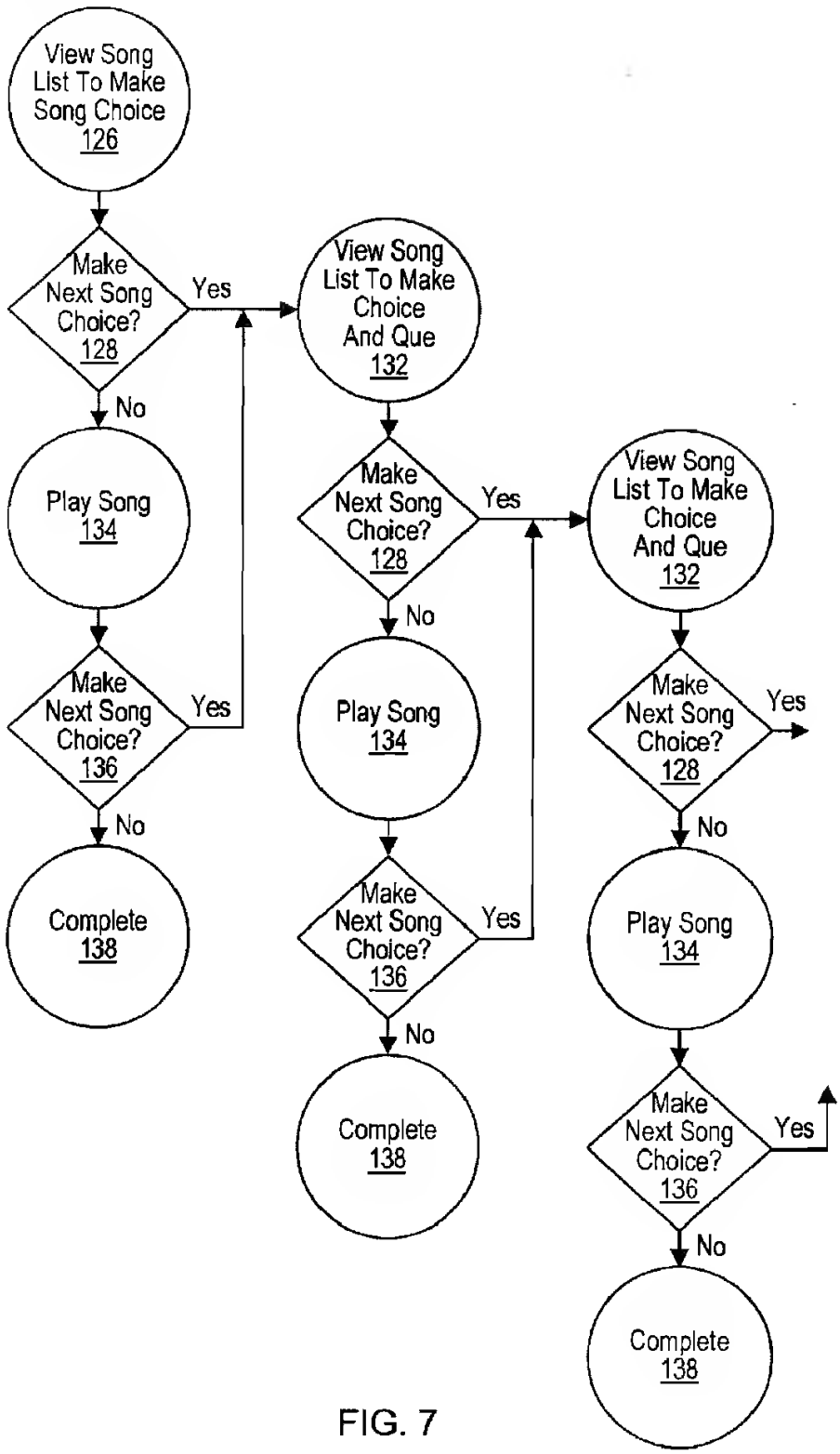

FIG. 7

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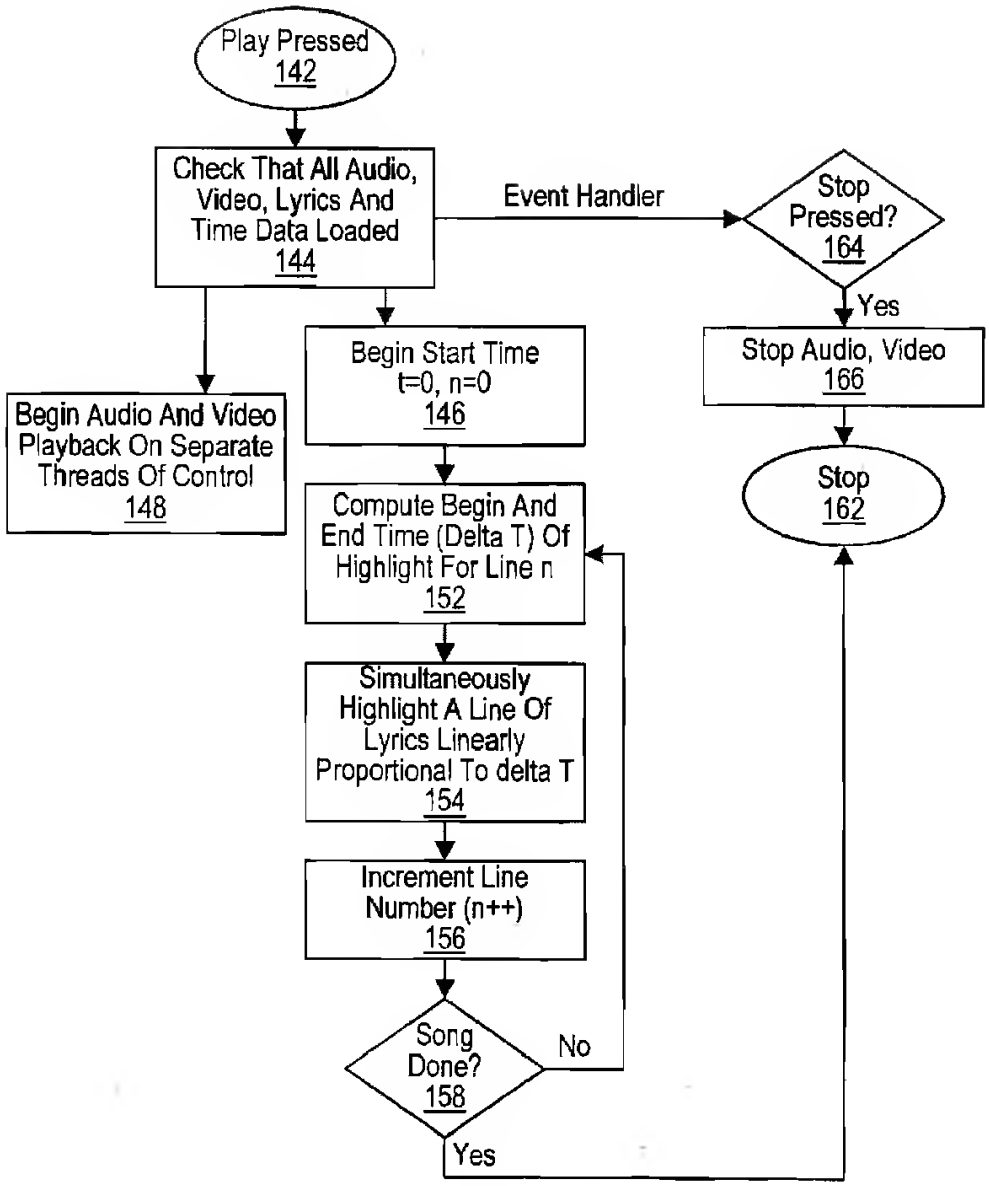

FIG. 8

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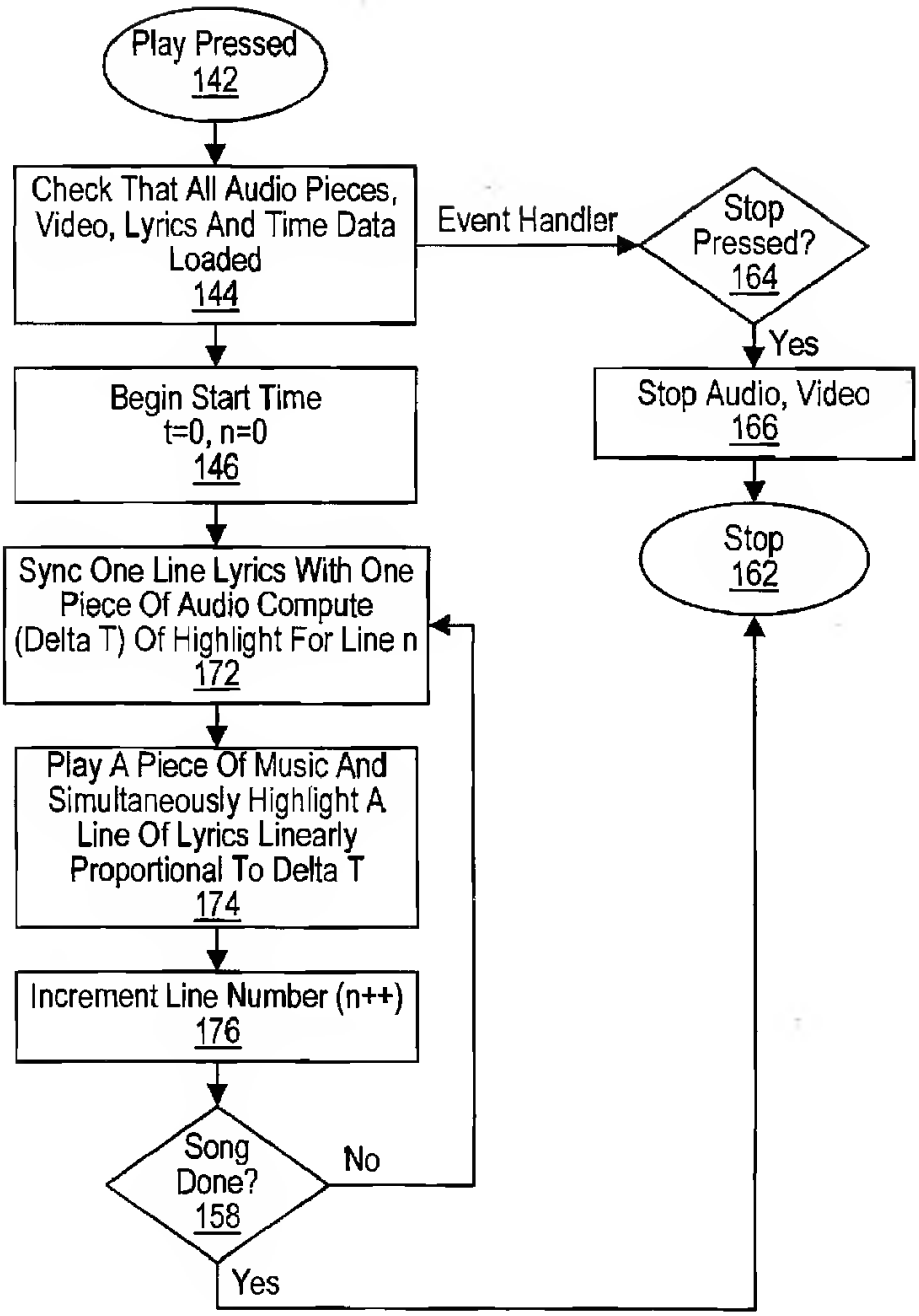

FIG. 9

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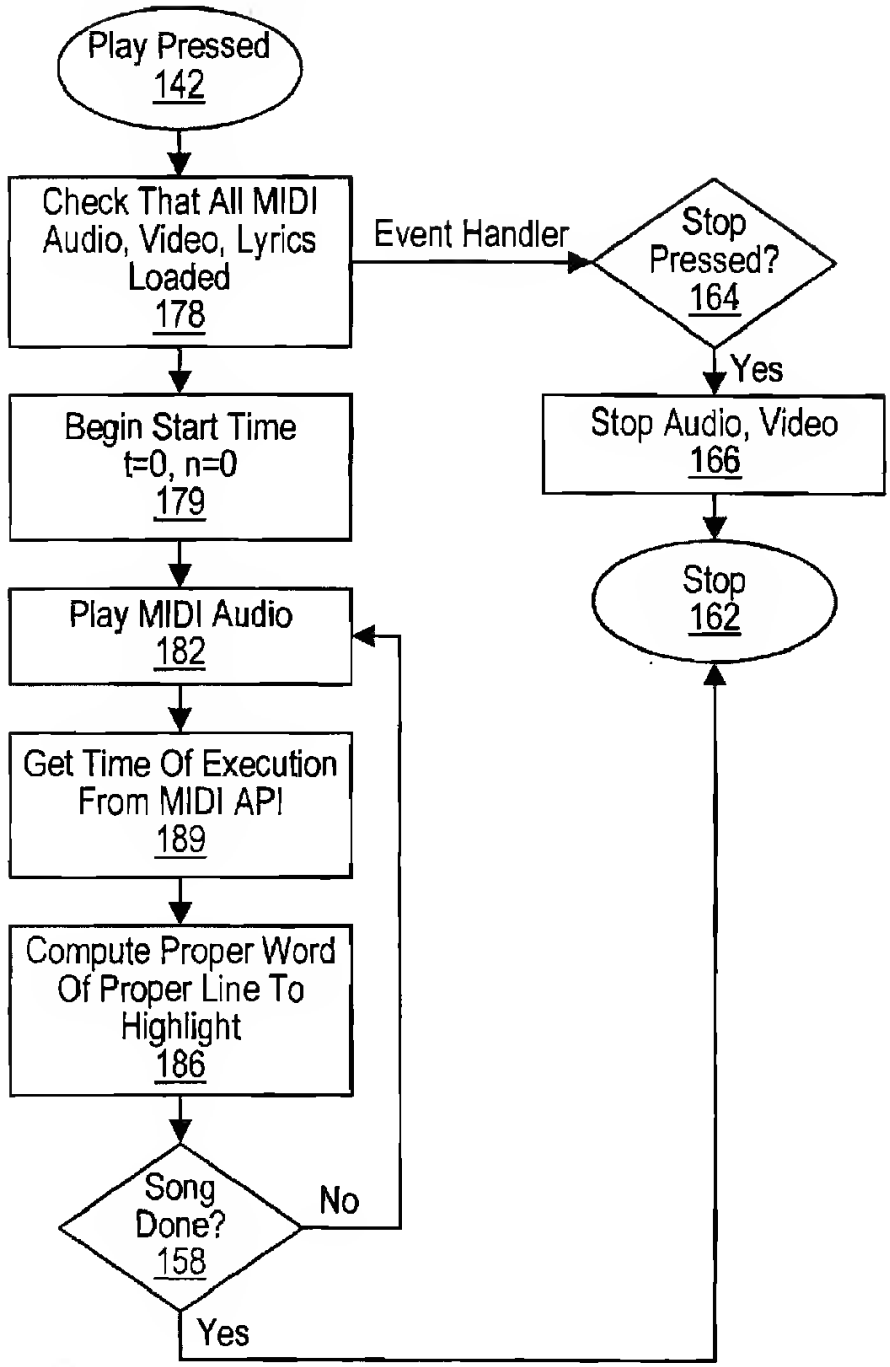

FIG. 10

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SYSTEM AND METHOD FOR ON-LINE MULTIMEDIA ACCESS

FIELD OF THE INVENTION

This invention relates to access to encrypted multimedia content data over an Internet-type distribution system, and more particularly to a way to improve a user's on-line multimedia experience.

BACKGROUND OF THE INVENTION

Traditional forms of entertainment are becoming increasingly digitized and accessible to a wider audience. For example, in Japan, a popular form of entertainment, Karaoke, is available to a wider participating audience as a result of digitization. Because digitization reduces the cost of many products and services, Karaoke "juke boxes" are found in many business establishments so that their patrons may enjoy their use.

Digitized Karaoke juke boxes are an improvement over traditional juke boxes. Instead of replacing vinyl records, a service technician visiting each site simply loads software to update the song choices available to the user with the latest music. Moreover, on a display, words can be scrolled at the same time as the music plays. This multimedia Karaoke experience, while an improvement over traditional juke boxes, however, is expensive since it requires service calls by technicians for updating. Moreover, there is a lag between the release of a song and the time it is installed on a Karaoke juke box. Furthermore, the Karaoke song list books are printed on paper and thus are easily lost, damaged or destroyed. Additionally, in accounting, it is difficult to keep track of the songs which have been played so that royalties may be paid to the artists. A new method and apparatus which does not require visits by technicians to Karaoke sites and resolves the other problems described above would be beneficial.

While Karaoke is enjoyed by patrons of business establishments, home Karaoke participation is currently limited to playing and singing along with a record or CD. Some of the disadvantages to a home Karaoke participant include that he/she must leave home to purchase the music content and that he/she does not have the sing along aid of scrolling words.

As more users access the Internet and the associated World-Wide-Web, more vendors are providing multimedia content data which is readily accessible by consumers. Depending upon the bandwidth capability of the transmission hardware, among other things, different types of content are accessible by consumers, including video, audio, graphic and ASCII data. Moreover, particularly with the advent of browser technology, such as Netscape, a user can readily access data from servers all over the world.

Recently, new programming languages have been developed which allows programs to be written which enhance browser technology. While not widely used yet, programs which are written in these languages can be embedded into a browser and promise to provide a user with a nearly seamless on-line multimedia experience. Such a language, Java (TM) language, has been developed by Sun Microsystems'(R) Computer Corporation.

Java is an object-oriented language similar to C++ in many ways, but specifically developed to provide cross-platform capability and reduce the complexities of C++. Generally speaking, an object-oriented language facilitates the clean definition of interfaces and makes it possible to provide reusable "software ICs." Java provides multimedia capabilities which are operating system and hardware independent. The Java software architecture is designed to support platforms ranging from personal computers to embedded network devices of the type similar to a Java desktop device (recently announced by Sun and Oracle). Sun Microsystems has a Java homepage where the Java language specifications can be accessed among other instructive programming materials at Http://JAVA.SUN.COM/doc/Overview/java/index.html.

It would be beneficial to both commercial and home users for the distribution of Karaoke and other multimedia content to be provided on-line by an Internet-type distribution system.

SUMMARY OF THE INVENTION

A user of this invention is able to access multimedia content on-line which is updated virtually simultaneously with the vendor's update process. In the event that a vendor updates the data frequently, the user will benefit tremendously, never experiencing a lag between the newest content and the delivery thereof. By a user accessing a page on the World Wide Web, for example, data (encrypted and unencrypted) and instructions are automatically downloaded to a user's computer system for quick access. Depending upon the user's computer system (LAN or a stand-alone personal computer), "applets" containing data and instructions are stored for immediate access. An applet in and of itself may contain a plurality of components, and a single click by the user may generate a download which fetches a plurality of applets. In any case, the applets are available for virtually immediate execution, making the multimedia experience seamless to the user.

For example, in a Karaoke application of this invention, where the user desires to access songs which are most popular at a given time, the user is completely unaware of the automatic delivery of an applet including data and instructions from a main data base server. When the user accesses a page, a song list and other information is displayed on a display apparatus. When the user clicks on a particular song of the song list, the applet executes an authentication request. If the user is authenticated, the authentication is downloaded as part of the applet containing the desired multi media content (or separately depending upon the circumstances). In the meantime, a new song may have reached number one standing in the charts, and the vendor has updated the main data base accordingly. While the user is still on the page, an applet containing a new song list is downloaded to user's computer system, so that in the near future, when the user goes to click another song for playing, the song list is updated and includes the newest and most popular songs.

A multimedia experience, inherent in its nature, will include different types of media content. For a seamless experience, each element's timing must be coordinated with the other elements' timing. According to this invention, an applet includes multimedia elements which further include timing codes and a synchronization function which provides for the synchronization of the delivery of the multimedia elements.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an overview of a distribution system used in conjunction with this invention;

FIG. 2 shows display screen output, among other things, offering a user song choices for a Karaoke application of this invention;

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FIG. 3 is a flow chart of choices provided to a user in a Karaoke application;

FIG. 4 is a flow chart illustrating the threads for delivery of the different multimedia content components;

FIG. 5 is a diagram illustrating the embedded nature of Java in a browser;

FIG. 6 is a flow chart illustration the authentication procedure of this invention,

FIG 7 is a flow chart illustrating the choose and play sequence of this invention;

FIG 8 is a flow chart illustrating a method of synchronization of multimedia elements;

FIG. 9 is a flow chart illustrating another method of synchronization of multimedia elements; and

FIG. 10 is a flow chart illustrating yet another method of synchronization of multimedia elements according to this invention.

DETAILED DESCRIPTION OF THE INVENTION

A user wishing to access a Karaoke application provided in accordance with this invention will access a Karaoke page via a browser such as Netscape. The browser supports Java so that the use of Java provides multimedia capabilities which are operating system and hardware independent. Accordingly, an applet including encrypted and unencrypted data and instructions will be delivered to the user's computer system to enable the user to make choices and thus send a request to a remote server for the delivery of multimedia content. Once authentication has taken place, one or more applets are sent by the remote server which deliver the multimedia content.

Applets are stored in a network of servers for efficient delivery to a user. FIG. 1 shows a main database 72 in communication with caching subservers 74*a*, 74*b*, 74c. 74*d* and 74*e*. The main server defines the master database of all songs released. This database can rely on any known database technology whose hardware will usually reside at the central distribution site for data defined by the implementor. Multiple main servers are permitted for redundancy.

Caching subservers define a location specific server which caches songs for distribution to local Karaoke clients. The purpose of the caching subservers is to reduce load on the main server generated by song requests, and reduce long distance network traffic to the main server by caching songs locally. If a caching server does not have in memory, a song, it will request it from the master list. Subserver 74*e* is further shown in communication with subservers 76*a*, 76*b* and 76*c*. Networked computers may be arranged in other configurations as well.

An array of dedicated Karaoke terminals 78*a*, 78*b* and 78*c* are in communication with subservers 74*b*, 74*c* and 74*d* respectively. The Karaoke terminal plays the songs but also may include, but is not required to have digital signal processing capability, stereo sound, remote control, a keyboard and a mouse. Alternatively, the Karaoke page is accessed, for example, by a user's personal computer, I AN, laptop, PDA, workstation, television or telephone 82*a*, 82*b* or 82*c*, wireless or wired. In any manner of transmission from a remote source, applets are automatically downloaded onto the user's computer system upon access to the page as described above.

Turning to FIG. 2, an example of a Karaoke page 10 on a display apparatus is shown. The user will view a song list 12 such as that shown on the left side of page 10. While the user scrolls the song list, various information is provided. For example, a song's standing in the charts at that particular time, its length and any other information pertinent to the song is optionally provided. Because a song's current standing in the charts is information which can change at any given moment, such information when available is automatically downloaded to the user while the user maintains access to the page. New songs which are released may also be downloaded to the user while the user maintains access to the page. Moreover, as the user is scrolling through the song list, still photographs or video clips of the performances by the artists are also provided.

The user will use the click of a mouse, or other input device, to choose a song 14 on the song list 12. As shown in FIG. 2, a user chose the song Boy Meets Girl by TRF. To the right side of the song list on the page, graphics, animation or a video 16 by the group TRF are shown. As the song plays, the words to the song are also displayed. As shown in FIG 2, the words are "Woo woo woo wo, BOY MEETS GIRL."

As the song continues to play and new verses are sung by the performer, the words displayed will change. Words (ASCII data) 18 may be displayed, for example, in segments or one at a time. In either event, the words displayed are synchronized with the words sung by the performer. In the case where a segment of words is displayed, the words on the screen are simultaneously highlighted against the background 22. Highlighting may instead be provided, for example, in a traditional bouncing ball format. An applet delivering multimedia content in accordance with this invention therefore includes the multimedia content data as well as instructions for providing the synchronization of different multimedia elements as will be described in detail below with reference to FIGS. 8–10.

The initial applet or applets delivered to the user may provide a number of choices to the user. The flowchart of FIG. 3 shows steps to carry out a selection process provided by the initially delivered applet or applets. When the user accesses a Web page 10 at box 30, he/she may make a choice from ASCII song list 14 at box 32. As mentioned above, components such as graphics, video and audio may also be delivered by an initial applet at box 34. Thus, as the song list scrolls at box 34, graphics, video, audio cuts from the songs or ASCII data such as a song s current standing may be accessed at boxes 36 and 38. Having decided upon a song, the user clicks to indicate his/her choice at box 42. User options include whether the song should be played with or without vocals at box 44; whether to raise or lower the key at box 46; a record of the number of times the song has been played by the user at box 48; whether to display video or graphics by the artist for an additional fee at box 52; whether to abort choice at box 54. Alternatively, the choices between boxes 44–54 may be suppressed or not offered. The selection is played at box 56. Once concluded, at box 58 the choice of whether to continue or to end is provided at boxes 62 and 64 respectively. Moreover, one of the above described user option boxes can include other features, such as to choose the language in which the vocalization is sung, for example, English or Japanese; whether the voice is female or male, tenor, alto or soprano, whether the voice is to sing a harmony with the original base melody; or whether to change the tempo or style of the song, for example, to a rap version, a easy listening version or country version.

After an initial applet is delivered, the multimedia content is delivered upon request, providing that the user has been authenticated. Turning to the flow chart of FIG. 4, when the user clicks on a home page with the browser, a server delivers the most current applet at boxes 84 and 86. After the

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song selection at box 42 (see FIG. 3) the applet calls back to the database (stored on main server 72 or a subserver) to request audio, video, timing and lyric information at box 88. At box 92, to deliver the content in a synchronized manner, the applet forks threads of control to fetch various data as shown the next boxes, 94, 96, 98, 102 and 104. At box 106, when the data is delivered to the user's computer system, it is assembled and played.

Since the delivered content data is encrypted, a key is needed for a user to decrypt it. The key may have been delivered with the initial applet or later. In any event, the key will not be provided to the user until the user has been authenticated. Authentication, for example, includes verifying payment data, a user password or a handshake with a form of personal identification such as a PCMCIA-based card, for example, a credit, debit, prepaid cash card or smart card.

FIG. 6 is a flowchart of the authentication thread 104 of FIG. 5. The authentication of this invention includes cryptographic portion and security access portions that control permissions for users to access songs, registration of usage of songs, data encryption of digital data, and valid usage lifetime of encrypted data (cf. http//www.omg.org follow links to security API for CORBA). That is, after an initial applet is delivered, and a user makes a choice and a request at box 108, authentication may be delivered before, at the same time or after the multimedia content elements are delivered depending on, for example, where particular threads of the applet shown in FIG. 4 are stored. Encrypted data is downloaded to the user at box 114 and stored on the user's computer system.

Upon authentication, a key is provided to the user to decrypt the multimedia content data so that the song plays at box 118. Depending upon the Karaoke business operation, the key may be disposable and therefore expire immediately upon decrypting the data, or may expire after a predetermined number of plays or within a time period such as twenty-four hours at box 122. With the ease of delivery of applets, a plurality of keys may be downloaded to a user's computer system in a manner invisible to the user. Moreover, as disposable keys are used, replacement keys are sent to the user's computer system for use later during the session. Once the user logs off page 10 at box 126, applets are removed from the user's computer system's memory. In this manner, piracy of content is particularly difficult since one key will decrypt encrypted data for one song which can expire after one play. Accordingly, access is more secure and thus multimedia content is better protected.

As mentioned above, Applets may be updated by the vendor and then automatically downloaded at any given time by the server. Turning to FIG. 6, an overview of particular elements of an applet is shown. As discussed above, Java applets 108 are embedded in the browser 112. The applet elements include data 114 and instructions 116 (functionality) which acts upon the data. The data is either unencrypted or encrypted data, the latter of course needing a key for the user's access.

The functionality 116 is provided by a set of instructions operating on applet data 114. Digital signal processing (DSP) functionality includes features shown in FIG. 3 used to lower or raise the song's key (box 46), to choose a song with or without vocals (box 44) or to slow or speed the song's tempo. Compression of data (and therefore its decompression) is also provided by the functionality of the applet. Where the data has been stored in, for example, a MIDI format (see FIG. 10), decompression instructions are an applet component. The authentication process as well as the associated activation of keys are also functionalities provided by the applet.

The functionality 116 instructions also act as an interface 118 to provide access to the server via common object request broker architecture (CORBA) (cf. http://www.omg.org). This is the open standard by which authentication and messaging between a Karaoke terminal and any server will communicate. When a song selection is made by the user, instructions 116 makes a request of the server. In responding, the system is able to keep track of how many times a particular song was requested. In this way, the vendor is able to keep track of the royalties due to the artist, the market demographics by region and thus age and income level so that pricing structures can better reflect the actual playing of the song. The interface with the server 118 can cause prompts for the user at the graphical user interface (GUI) 122. Moreover, once a user has accessed the page 10 and applets are being downloaded, the interface 118 can signal to bring in more applets at appropriate times, for example, to offer coupons for goods or services which can be printed on the user's printer or electronically stored for use on-line or to make other offers such as concert tickets or entries into contests. In this manner data request box 124 makes the request to the server so that another applet is subsequently downloaded on the user's system to satisfy the request.

Depending upon the circumstances, a user will either request a song or request a series of songs. Turning to FIG. 7, a flow chart is shown providing for the simultaneous play and search capability of this invention. The song list 12 (see FIG. 2) is review by the user and the user makes a song selection at box 126. A prompt for the next song selection is provided at box 128. The user may make the selection to queue the song at box 132. If the user chooses not to make the next selection, the chosen song plays or continues to play at box 134. While the song continues to play, the selection prompt is still available to the user so that he/she may make the next song choice before the first song is over or at its completion at box 136. In the event the first song is still playing, the next song is put into a song queue at box 132. In the event that the first song is completed and no other song choices are made, then the program is complete at box 138. This process, as shown in FIG. 7, can be repeated so that a user can queue an entire song repertoire before the activation of the first play or while the play is proceeding. In the meantime, as discussed above, the vendor may have updated the song list and new applets and/or data are being downloaded to the user's system so that song choices are updated in a seamless manner.

As discussed above with reference to FIG. 4, this invention includes instructions to generate and control multimedia content output including audio output from an audio data element, ASCII output from an ASCII data element and graphics output from a graphics data element, wherein the ASCII output and the graphics output are displayed on a display apparatus, the combination of which is delivered in a synchronized manner with the audio output in accordance with a timing data element. Also as mentioned above, the Karaoke applets run inside a browser, providing for the user selection of a song, downloads audio, downloads the video images, downloads the ASCII lyrics and downloads the timing data. Each download occurs using a separate thread of control for asynchronicity and better bandwidth usage. Pressing the "play" button causes the song to play. Pressing the "stop" button halts the play. Each time play is pressed, timing resynchronization with the words occurs. This inven-

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tion can support multiple types of timing synchronization providing varying qualities of service. Below, three types are discussed.

Referring to FIG. **8**, play is input by the user at box **142**. A check is made that all the audio, video, lyrics and time data are loaded at box **144**. The audio data include any form of digital audio data, such as .au, .snd, .aiff, etc. file formats. Audio data also includes MIDI format audio, and any compression of the audio. The video data include picture based formats (.gif, .jpg, etc.) and any other motion picture format data such as mpeg and .avi. The timing data defines the list of times that are associated with the vocalization of words within a song. The text data in both single-byte and double-byte (internationalized and localized fonts) of the words to a song.

When a song begins to play, the start time is t=0 and the increment number is n=0 at box **146**. The increment number is equal to the ASCII line number. An additional variable, x, represents the graphical output for highlighting and is linear with t and n. At this time, the audio, video and lyrics begin to playback on separate threads of control at box **148**. A computation is then made to compute the beginning and the ending time (delta T) of the highlight for an ASCII line associated with n at box **152** so that the highlight of a line of lyrics is simultaneously provided in a manner linearly proportional to delta T at box **154**. To move onto the next line number, increment line number (n++) at box **156**. For each line n highlighted, a data block of audio n is played. After a sufficient number of increments of n, the system asks whether the song is done at box **158**. If it is, the play stops at box **162**. If the song is not done, it loops back to box **152**. Alternatively, if stop had been pressed at any time at box **164**, the audio and video would stop at box **166**.

Where it is possible to fragment the audio ASCII and graphical highlighting into pieces, synchronization between lyric highlighting and the words playing is better enabled. The increment number n counts the data fragments. The data is fragmented into equal sized data blocks, each having a delivery time equal to T. Turning to FIG. **9**, in this way, at box **172**, one line of lyrics is fragmented so that it is in sync with one piece of the audio component (delta T) so that the synchronization of the two takes effect for that particular delta T. Additionally, the graphical output x is also fragmented to match word for word the audio output with the ASCII output. At box **174**, the content is delivered accordingly. At box **176**, the line is incremented by one fragment and the process returns to box **172** until the song is completed. In this way, if there is a defect in the data producing the equivalent of a skip in the music, then the timing will still be re-synchronized at the next t=0.

Where the MIDI standard is incorporated into the timing process of this invention as shown in FIG. **10**, at box **178** the system checks that all the MIDI audio, video, lyrics and graphics are loaded (no separate timing data thread is needed). The process begins at t=0 and n=0 at box **179** where n is defined by the MIDI standard. At box **182**, the MIDI audio is played and the time of execution is retrieved from MIDI API at box **184**. Accordingly, the proper word of proper line to highlight is computed by MIDI algorithms at box **186**. If the song is done, the system ends the procedure. If not, the system loops back to box **182**.

Accordingly, a seamless multimedia experience is provided in that each elements' timing is coordinated with the other elements' timing. According to this invention, an applet can include multimedia elements which include timing codes or the data can be configured as per a standard like MIDI for the synchronized delivery of the multimedia elements. Applications for this invention include noise dependent games (such as mechanical, such as panchiko or video games, such as Pacman or SkyBlaster) or customizable games, where the visual aspects of the game must be synchronized with the visual components to resemble mechanical variations of the game. For example, the visual components of the game panchiko include metal balls which move in a vertical fashion, their clanking representable by synchronized audio components. In such a case the variables discussed in reference to FIG. **9** would include audio, visual and ASCII as well which is preprogrammed to represent output based on a user's input (game playing). Moreover, other gambling games such as slot machines may be implemented in accordance with this invention where the mechanical operation is visual component and the associated mechanical noises are the audio components. The ASCII data is in the form, for example, of winnings which could be applied as a credit to one's credit card or PCMCIA-based card or smart card.

Server systems and subsystems incorporating features of this invention can be implemented entirely in hardware, or in a combination of hardware and software (i.e., program modules stored in memory). For example, the browser embedded component or applet can be implemented entirely in software. Suitable media for server software include, for example, magnetic media **80** (See FIG. 1) (e.g., disks and tapes), optical media (e.g., CD-ROMs), DRAMs and SRAMs. In addition, software can either be pre-loaded into the server system or loaded by the user electronically with or without the use of tangible storage media, e.g., by downloading program modules to the user's server from ftp/telnet or html sites on the Internet or WorldWide Web, respectively.

Thus, program modules incorporating features of the invention can be conveniently distributed by CD-ROM, for example, or by accessing a Web site. In the latter case, the modules are typically loaded temporarily from permanent storage into RAM and/or output buffers of the Web server, i.e., these are the media serving to store and distribute the program modules of the invention whenever a download request is made. After loading into RAM, the Web server transmits the program modules to the user's host.

I claim:

1. A system for providing on-line multimedia content output to a user on said user's computer system, comprising:

a browser configured to provide access to a page and at least one component, wherein said at least one component has multimedia audio, graphics, text and timing data elements, wherein said at least one component further includes instructions which when executed synchronize the delivery of said multimedia data elements, and wherein said at least one component further includes encrypted data and unencrypted data and authentication instructions executable with respect thereto;

a display unit configured to display said unencrypted data in a manner which enables said user to make a multimedia content output choice;

an output unit configured to generate on said display unit a representation of unencrypted data in a manner which enables said user to make a multimedia content output choice and an authentication request;

a processor configured to generate said multimedia content output choice and said authentication request;

an execution unit configured to execute said authentication request in order to provide a disposable key to

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decrypt some of said encrypted data to generate multimedia content output therefrom;

a receiver configured to receive said authentication request and to provide said disposable key to decrypt said some of said encrypted data to generate said multimedia content therefrom,

a processor configured to receive said disposable key and to decrypt said some of said encrypted data to generate said multimedia content therefrom while said disposable key is valid,

a transmitter configured to automatically download said at least one component to said user's computer system including a display apparatus; and

an execution unit configured to execute said instructions to generate said multimedia content output including audio output from said audio element, text output from said text data element and graphics output from said graphics data element, said text output and said graphics output being displayed on said display apparatus of said user's computer system, the combination of which being delivered in a manner synchronized with said audio output in accordance with said timing data element.

2. A system as recited in claim 1 wherein said audio output is in the form of a song having words.

3. A system as recited in claim 2 wherein said text output is in the form of ASCII words.

4. A system as recited in claim 3 wherein said graphics output is in the form of highlights on said words which are displayed on said display apparatus in a synchronized manner with said audio output words in accordance with said timing element.

5. A system as recited in claim 2 wherein said text output is in the form of international multi-byte fonts.

6. A system as recited in claim 1 wherein said graphics output is in the form of a panchiko game having metal balls which is displayed on said display apparatus.

7. A system as recited in claim 6 wherein said audio output is resembles the sound of metals balls clanging, such audio output delivered in a synchronized manner with said graphics output in accordance with said timing element.

8. A system as recited in claim 1 wherein said audio data element is fragmented into audio fragments having delta time in length and wherein said text data element is fragmented into text fragments having delta time in length, said system further comprising:

a generator configured to generate simultaneous output of audio fragments and text fragments at the beginning of said delta time.

9. A system as recited in claim 1 wherein said component is an applet.

10. A system as recited in claim 1 wherein said text output further includes a list of songs from which a user can choose, and wherein said execution unit is further configured to allow said user to choose songs from said list so that said delivery of said songs' multimedia data elements is queued for sequential delivery.

11. A system as recited in claim 1 wherein said disposable key is only valid for a predetermined period of time.

12. A method for providing on-line multimedia content output to a user on said user's computer system, comprising the steps of:

via a browser, providing access to a page and at least one component, wherein said at least one component has a plurality of elements including multimedia audio, graphics, text and timing data elements, wherein said at least one component further includes instructions which when executed synchronize the delivery of said multimedia content data elements to said user's computer system, and wherein said at least one component further includes encrypted data and unencrypted data and authentication instructions executable with respect thereto;

automatically downloading said at least one component to said user's computer system;

displaying unencrypted data in a manner which enables said user to make a multimedia content output choice;

generating on said display apparatus a representation of said unencrypted data in a manner which enables said user to make a multimedia content choice and an authentication request;

generating said multimedia content output choice and said authentication request;

executing said authentication request in order to provide a disposable key to decrypt some of said encrypted data to generate said multimedia content output therefrom;

receiving authentication in response to said authentication request, including said disposable key to decrypt said some of said encrypted data to generate said multimedia content therefrom while said disposable key is valid;

decrypting said some of said encrypted data to generate said multimedia content therefrom while said disposable key is valid; and

executing said instructions to generate multimedia content output including audio output from said audio data element in the form of a song having words, text output from said text data element being displayed on a display apparatus and graphics output from said graphics data element being displayed on said display apparatus in the form of highlights on said text in a synchronized manner with said audio output in accordance with said timing data element.

13. A method as recited in claim 12 wherein said audio data element is fragmented into audio fragments having delta time in length and wherein said text data element is fragmented into text fragments having delta time in length, said method further comprising the step of:

simultaneously outputting said audio fragments and text fragments at the beginning of said delta time.

14. A method as recited in claim 12 wherein said text output is in the form of ASCII words.

15. A method as recited in claim 12 wherein said text output is in the form of international multi-byte fonts.

16. A browser embedded component, comprising:

multimedia audio, graphics, text and timing data elements;

instructions which when executed synchronize the delivery of said multimedia data elements;

encrypted data and unencrypted data and authentication instructions executable thereto;

a first execution element configured to display on a display apparatus said unencrypted data in a manner which enables a user to make a multimedia content output choice, to generate on said display apparatus a representation of said unencrypted data in a manner which enables said user to make a multimedia content choice and an authentication request, to generate said multimedia content output choice and said authentication request in order to request a disposable key to decrypt some of said encrypted data to generate said multimedia content therefrom; and

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a second execution element configured to receive said disposable key to decrypt said some of said encrypted data to generate said multimedia content therefrom while said disposable key is valid, to decrypt said some of said encrypted data to generate said multimedia content therefrom while said disposable key is valid, and to execute said instructions to generate multimedia content output including audio output from said audio data element. text output from said text data lament and graphics output from said graphics data element, said text output and said graphics output being configured for display on said display apparatus, the combination of which being delivered a synchronized manner with said audio output in accordance with said timing data element

17. An embedded component as recited in claim **16** wherein said audio output when generated is in the form of a song having words.

18. An embedded component as recited in claim **16** wherein said text output when executed is in the form of ASCII words.

19. An embedded component as recited in claim **16** wherein said text output is in the form of international multi-byte fonts

20. An embedded component as recited in claim **16** wherein said graphics output when executed is in the form of highlights on said text output which are configured to be displayed on a display apparatus in a synchronized manner with said audio output words in accordance with said timing element.

21. An embedded component as recited in claim **16** wherein said graphics output when executed is in the form of a panchiko game having metal balls which is configured to be displayed on a display apparatus.

22. An embedded component as recited in claim **16** wherein said audio output when executed resembles the sound of metals balls clanging, such audio output delivered in a synchronized manner with said graphics outpnt in accordance with said timing element.

23. An embedded component as recited in claim **16** wherein said audio data element is fragmented into audio fragments having delta time in length and wherein said text data element is fragmented into text fragments having delta time in length, said component further comprising:

an execution unit configured to provide the simultaneous output of audio fragments and text fragments at the beginning of said delta time.

24. A browser embedded component as recited in claim **16** wherein said disposable key is only valid for a predetermined period of time

25. A system for providing on-line multimedia content output to a user on said user's computer system. comprising.

browser means for providing access to a page and at least one component, wherein said at least one component has a plurality of elements including multimedia audio, graphics, text and timing data elements. wherein said at least one component further includes instructions which when executed synchronize the delivery of said multimedia content data elements to said user's computer system, and wherein said at least one component further includes encrypted data and unencrypted data and authentication instructions executable with respect thereto,

downloading means for automatically downloading said at least one component to said user's computer system;

display means for displaying unencrypted data in a manner which enables said user to make a multimedia content output choice,

first generating means for generating on said display apparatus a representation of said unencrypted data in a manner which enables said user to make a multimedia content choice and an authentication request;

second generating means for generating said multimedia content output choice and said authentication request,

first executing means for executing said authentication request in order to provide a disposable key to decrypt some of said encrypted data to generate said multimedia content output therefrom,

receiving means for receiving authentication in response to said authentication request, including said disposable key to decrypt said some of said encrypted data to generate said multimedia content therefrom whde said disposable key is valid,

decrypting means for decrypting said some of said encrypted data to generate said multimedia content therefrom while said disposable key is valid, and

second executing means for executing said instructions to generate multimedia content output including audio output from said audio data element, text output from said text data element and graphics output from said graphics data element, said text output and said graphics output being delivered in a synchronized manner with said audio output in accordance with said timing data element.

26. A system as recited in claim **25** wherein said graphics output is in the form of highlights on words of said text output which are configured to be displayed on said display apparatus in said synchronized manner with words of said audio output in accordance was said timing data element

27. A system as recited in claim **25** wherein said audio data element is fragmented into audio fragments having delta time in length and wherein said text data element is fragmented into text fragments having delta time in length, said system further comprising:

output means for the simultaneous output of audio fragments and text fragments at the beginning of said delta time.

28. A system as recited in claim **25** wherein said text output further includes a list of songs from which a user can choose, and wherein said execution means further executed instruction which allow said user to choose songs from said list so that said delivery of said songs' multimedia data elements is queued for sequential delivery.

29. A server, comprising:

a storage unit configured to store a browser embedded component including:

multimedia audio, graphics, text and timing data elements;

instructions which when executed synchronize the delivery of said multimedia data elements;

encrypted data and unencrypted data and authentication instructions executable thereto:

a first execution element configured to display on a display apparatus said unencrypted data in a manner which enables a user to make a multimedia content output choice, to generate on said display apparatus a representation of said unencrypted data in a manner which enables said user to make a multimedia content choice and an authentication request, to generate said multimedia content output choice and said authentication request in order to request a disposable key to decrypt some of said encrypted data to generate said multimedia content therefrom, and

a second execution element configured to receive said disposable key to decrypt said some of said

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encrypted data to generate said multimedia content therefrom while said disposable key is valid, to decrypt said some of said encrypted data to generate said multimedia content therefrom while said disposable key is valid, and to execute said instructions to generate multimedia content output including audio output from said audio data element, text output from said text data lament and graphics output from said graphics data element, said text output and said graphics output being configured for display on said display apparatus, the combination of which being delivered a synchronized manner with said audio output in accordance with said timing data element; and

a transmitter configured to transmit said browser embedded component from said storage unit to a remote computer system

30. A server as recited in claim **29** wherein upon execution by said second execution element, said graphics output is in the form of highlights on words of said text output which are configured to be displayed on said display apparatus in said synchronized manner with words of said audio output in accordance was said timing data element

31. A server as recited in claim **29** wherein said audio data element is fragmented into audio fragments having delta time in length and wherein said text data element is fragmented into text fragments having delta time in length wherein said execution element further comprises:

a generator configured to generate simultaneous output of audio fragments and text fragments at the beginning of said delta time.

32. A server as recited in claim **29** wherein said disposable key is only valid for a predetermined period of time.

33. A computer system, comprising:

a transmission reception unit configured to receive data and instructions from a remote source; and

a storage unit configured to store said data and instructions which are a part of a browser embedded component which is automatically downloaded thereto upon access to a page provided on said remote source, said browser embedded component including:

multimedia audio, graphics, text and timing data elements;

instructions which when executed synchronize the delivery of said multimedia data elements;

encrypted data and unencrypted data and authentication instructions executable thereto;

a first execution element configured to display on a display apparatus said unencrypted data in a manner which enables a user to make a multimedia content output choice, to generate on said display apparatus a representation of said unencrypted data in a manner which enables said user to make a multimedia content choice and an authentication request, to generate said multimedia content output choice and said authentication request in order to request a disposable key to decrypt some of said encrypted data to generate said multimedia content therefrom, and

a second execution element configured to receive said disposable key to decrypt some of said encrypted data to generate said multimedia content therefrom while said disposable key is valid, to decrypt said some of said encrypted data to generate said multimedia content therefrom while said disposable key is valid, and to execute said instructions to generate multimedia content output including audio output from said audio data element, text output from said text data lament and graphics output from said graphics data element, said text output and said graphics output being configured for display on said display apparatus, the combination of which being delivered a synchronized manner with said audio output in accordance with said timing data element.

34. A computer system as recited in claim **33** wherein upon execution by said second execution element, said graphics output is in the form of highlights on words of said text output which are configured to be displayed on said display apparatus in said synchronized manner with words of said audio output in accordance was said timing data element.

35. A computer system as recited in claim **33** wherein said audio data element is fragmented into audio fragments having delta time in length and wherein said text data element is fragmented into text fragments having delta time in length wherein said execution element further comprises:

a generator configured to generate simultaneous output of audio fragments and text fragments at the beginning of said delta time.

36. A computer system as recited in claim **33** wherein said browser embedded component is an applet.

37. A computer-readable medium having computer readable code stored therein, comprising:

a computer-readable code module configured to store multimedia audio, graphics, text and timing data elements;

instructions which when executed synchronize the delivery of said multimedia data elements,

encrypted data and unencrypted data and authentication instructions executable thereto; and

configured to display on a display apparatus said unencrypted data in a manner which enables a user to make a multimedia content output choice, to generate on said display apparatus a representation of said unencrypted data in a manner which enables said user to make a multimedia content choice and an authentication request, to generate said multimedia content output choice and said authentication request in order to request a disposable key to decrypt some of said encrypted data to generate said multimedia content therefrom, to receive said disposable key to decrypt said some of said encrypted data to generate said multimedia content therefrom while said disposable key is valid, to decrypt said some of said encrypted data to generate said multimedia content therefrom while said disposable key is valid, and

configured to execute said instructions to generate multimedia content output including audio output from said audio data element, text output from said text data lament and graphics output from said graphics data element, said text output and said graphics output being configured for display on said display apparatus, the combination of which being delivered a synchronized manner with said audio output in accordance with said timing data element

38. A computer readable medium as recited in claim **37** wherein said audio output when generated is in the form of a song having words.

39. A computer readable medium as recited in claim **37** wherein said text output when executed is in the form of ASCII words.

40. A computer readable medium as recited in claim **37** wherein said text output is in the form of Japanese characters.

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41. A computer readable medium as recited in claim 37 wherein said graphics output when executed is in the form of highlights on said text output which are configured to be displayed on a display apparatus in a synchronized manner with said audio output words in accordance with said timing element.

42. A computer readable medium as recited in claim 37 wherein said graphics output when executed is in the form of a panchiko game having metal balls which is configured to be displayed on a display apparatus.

43. A computer readable medium as recited in claim 37 wherein said audio output when executed resembles the sound of metals balls clanging, such audio output delivered in a synchronized manner with said graphics output in accordance with said timing element.

44. A computer readable medium as recited in claim 37 wherein said audio data element is fragmented into audio fragments having delta time in length and wherein said text data element is fragmented into text fragments having delta time in length, said component further comprising:

an execution unit configured to provide the simultaneous output of audio fragments and text fragments at the beginning of said delta time.

45. A computer-readable medium as recited in claim 37 wherein said disposable key is only valid for a predetermined period of time.

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